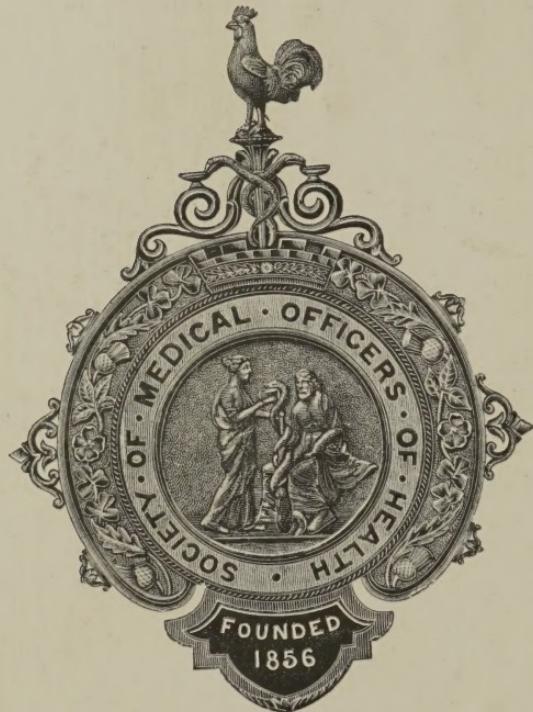


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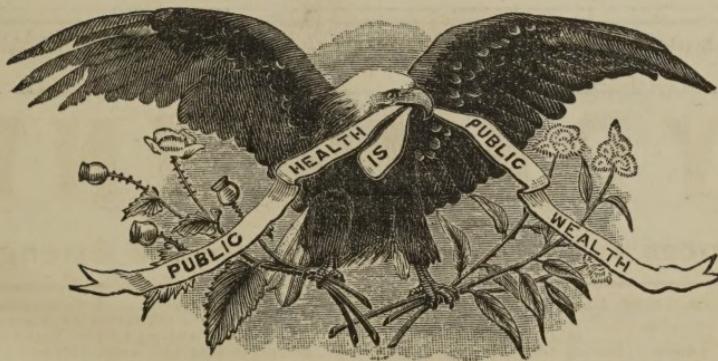
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DEVOTED TO THE

PRESERVATION OF HEALTH, MENTAL
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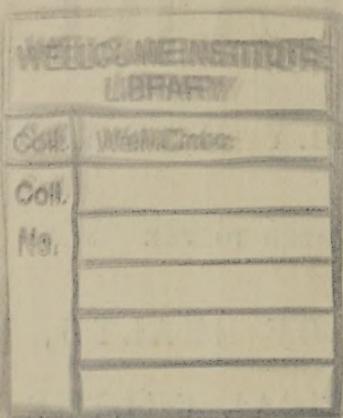
VOLUME XXVI. JANUARY TO JUNE.

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SANITATION IN 1890.

ADDRESS AT THE EIGHTEENTH ANNUAL MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, AT CHARLESTON, S. C., DECEMBER 16TH, 1890.

By HENRY B. BAKER, A.M., M.D., of Lansing, Mich., President.

IN accordance with the custom in this Association, this address is now presented in order to supply a general view of the present status of public health work in this country, to bring briefly before us a review of some of the progress made, especially since the last meeting of this Association, and to suggest directions in which effort seems to be needed in order that progress shall be most satisfactory and promising for the future.

Many of you are as familiar as I am with these several topics, but as each member of our Association views them from a different standpoint, there is reason for a hope that what is presented in this address may not be tiresome, and I do not forget that there are some present to whom public health topics must be new. To such persons I may say that, although many of its members are physicians, this Association is not a medical association; although many of its members are especially well informed on subjects relating to personal hygiene, yet personal hygiene is not the subject which is uppermost in the minds of members of this Association. If you ask, What, then, are the objects of this Association? the reply is found in its name—"The American Public Health Association"—and in its constitution, wherein it is stated, "The ob-

jects of this Association shall be the advancement of sanitary science, and the promotion of organizations and measures for the practical application of public hygiene."

The founders of this Association recognized the fact that in civilized society the life and health of every person is more or less bound up with the life and health of every other person ; that not only is man his " brother's keeper," but on each person there rests some responsibility for the welfare of all—some responsibility for the public health ; and each person has a vital interest in the public health, because of its bearing upon self-preservation.

We have all heard that " self-preservation is the first law of nature." But I think we must admit that it is not the first, but more frequently the last law of the law-maker. Laws for the preservation of human life and health, in accordance with sanitary science, are of slow growth, and an important object of this Association is " the promotion of organizations" " for the practical application" of sanitary science for the public good, and such organizations for the public good can, as a rule, best exist only through public law, and the ordinary governmental methods.

Governmental methods differ somewhat in the different parts of America, and we must remember that this Association includes representatives not only from the several States of this Union, but also from the Provinces and the Dominion of Canada ; and I am happy to say that this year marks a new epoch, for we have with us officially appointed representatives from the General Government of Mexico, eminent members of its Superior Council of Health.

If, then, this address is to deal with those objects for which this Association was organized, it must deal with the advancement of sanitary science, and the promotion of sanitary organizations ; and, in the United States, the most perfect " organizations" for the practical application of measures for the public good must conform to our form of government, " of the people, for the people, by the people." In my opinion there should be such a sanitary organization for the United States, and for each other general government, for each of the several States and Provinces, and for each of the numerous local governments.

ADVANCEMENT OF SCIENCE—THE CAUSATION OF DISEASES.

It seems evident that no great and substantial progress can be made toward the prevention or avoidance of a disease until we have knowledge of its causation. Therefore the work which it is most important shall be first accomplished is that which shall yield us knowledge of the causation of each disease. Within recent years much progress has been made in this important fundamental knowledge, thanks especially to two enlightened governments—Germany and Great Britain.

It should be clearly held in mind that there are seldom less than three important factors, neither of which can be neglected in studying the causation of a disease. For instance, there is (1) the "specific" cause, (2) what (when dealing with atmospheric conditions) I have called the "controlling" cause, and (3) the "predisposing" cause.

Causation of Consumption.—By all means the most important addition to our knowledge in this field is that for which we are chiefly indebted to Dr. Robert Koch, of the Imperial Board of Health of Germany—the definite knowledge of the tubercle bacillus—the "specific" cause of consumption, the disease which causes the greatest mortality in this country and throughout the world.

Every year there is being rapidly added to our knowledge details of the controlling conditions, predisposing causes, and modes of spread of that most important disease—knowledge which will enable us to explain the methods by which this most dread disease may be prevented.

Causation of Pneumonia.—The necessity for further knowledge of the causation of a disease than is supplied by knowledge of its "specific" cause is exemplified in the case of pneumonia, which disease, it is believed, can be artificially produced in lower animals by means of its specific cause,* yet the causation of which in man and in animals is certainly proved (by statistics and by direct experiments) to be controlled, in great part, by conditions of the atmosphere.†

* Report of Secretary of the State Board of Health, Mich., 1886, p. 315; also *Il Morgagni*, Oct., Nov., Dec., 1888; also *Trans. Md. Med. and Chirurg. Fac.*, April, 1889, p. 112; also *Bulletin Général de Thérapeutique*, Paris, Dec. 15, 1889, pp. 520; also *Boston Med. and Surg. Jour.*, Jan. 23, 1890; also *Therapeutic Gazette*, vol. xiv., No. 2, Feb. 15, 1890, p. 142.

† "The Causation of Pneumonia," Report Mich. State Board of Health,

One attempt to harmonize the facts from these two very different sources is that by Dr. William B. Canfield, who says: "In the light of recent studies made by Metschnikoff,* Baumgarten,† Osler,‡ and others, it is more than probable that the phagocytes in a healthy individual, having healthy movements, are able to seize and assimilate the invading organisms, and it is only when an individual not well when the phagocytes lose the power to battle against the specific organism of pneumonia from prolonged exposure to cold, that pneumonia sets in."§

But experiments, more recent than those referred to by Dr. Canfield, by Nutall, Buchner, Nissen, Lubarsch, Prudden, and others indicate that the blood serum, even more than the leucocytes, is concerned in the destruction of pathogenic micro-organisms.||

Causation of Diphtheria.—Evidence had been accumulating, and it now seems to be established that the bacillus discovered by Loeffler is a specific cause of diphtheria. Dr. Klein, F.R.S., London, has demonstrated that in the cow inoculated with diphtheria, the bacillus passes into the milk. This may account for the spread of diphtheria in some cases otherwise unaccountable. In the trachea of cats the bacillus is alleged to have caused pneumonia,¶ which was, I suppose, diphtheritic. Some experiment with doves by Babes and Piscariu,** two French pathologists, seem to have been especially well planned, and to have yielded particularly important results. They found that the bacillus—the specific "germ"—promptly caused diphtheria in doves whose throats were scarified before the application of the bacilli, but did not cause the disease in

1886, pp. 246-324; also Reports and Papers, Amer. Pub. Health Assoc., 1887, p. 30; also *Bulletin Général de Thérapeutique*, Paris, Dec. 15, 1889, p. 520; also Boston Med. and Surg. Jour., Jan. 23, 1890; also Therapeutic Gazette, vol. xiv., No. 2, Feb. 15, 1890, p. 142.

* Virchow's Archiv., vol. xcvi. and xcvi.

† Zeitschrift f. Kl. Medicin, Bd. xv., 1 and 2.

‡ N. Y. Medical Record, April 13, 1889.

§ T. Mitchell Prudden, M.D., in Med. Record, N. Y., Jan. 25, 1890.

|| Trans. Md. Med. and Chirurg. Fac., April, 1889, p. 112.

¶ "Public Health," Minnesota St. Bd. of Health, vol. vi., No. 4, June, 1890, p. 33.

** Zeit. für Hygiene, vol. viii., part 3d. The Sanitary Inspector, Maine, July, 1890, pp. 6-7.

doves with perfectly healthy throats. That something analogous to this is true, as a rule, concerning diphtheria in man, was claimed to have been indicated by myself some years ago, especially in my paper on the "Causation of the Cold Weather Diseases." * The hypothesis which I then published I still believe to be the true explanation as to the way in which the throat is irritated and made sore, and consequently susceptible to diphtheria and other diseases, by exposure to the inhalation of air unusually cold and dry. But Dr. K. E. Wagner (*Annales de l'Institut Pasteur*, p. 570, No. 9, t. 4, September 25th, 1890) has repeated Pasteur's experiments, producing anthrax in fowls by lowering their temperature by cold water, and has found that it can be done if the lowering is by means of antipyrin. His experiments indicate that when the temperature is lowered the rate of destruction is less than the rate of reproduction of the anthrax bacilli, while at the normal temperature of fowls, and especially when raised by the injection of the bacilli, the rate of destruction of the bacilli is greater than their reproduction in the bodies of the fowls, especially in the blood. Outside the body at such temperatures (42° C. to 43° C.) the anthrax bacilli do not form spores, and are killed in nine days.†

Experiments are needed to prove whether what is true of anthrax is also true of the other diseases which I have shown to be most prevalent after the cold weather.‡

Whether or not my hypothesis shall be found to be the correct explanation relative to the entrance of diphtheria, experiments indicate that it is true, in part at least, relative to pneumonia,§ and the fact now seems to be established that diphtheria, small-pox, pneumonia, and some other diseases that usually enter the body by way of the throat or air passages are increased in prevalence at such times as people are exposed to cold atmosphere.

* Report Mich. State Board of Health, 1887, pp. 197-211.

† Supplement to the British Med. Jour., Nov. 29, 1890, p. 72.

‡ Report Mich. State Board of Health, 1888, pp. 143-169; Jour. Amer. Med. Assoc., Jan. 18 and 25, 1890, pp. 73-84, 116-29.

§ Dr. Vito Platania, in Italy, *Giornale intern. delle scienze mediche, fascicule v.*; also *Bulletin Général de Thérapeutique*, Paris, Dec. 15, 1889, p. 520; also Boston Med. and Surg. Jour., Jan. 23, 1890; also *Therapeutic Gazette*, vol. xiv., No. 2, Feb. 15, 1890, p. 142.

Quarantine.—It is significant of great progress, I think, that the diseases which it now seems most important to dwell upon are not the same as in former times. Comparatively little is now said of small-pox, cholera, or yellow-fever. In this country those diseases are not such important causes of death as consumption, diphtheria, or scarlet-fever. For this result general progress in sanitary administration must receive much credit; but I think that, in this country, much credit must also be due to the greatly increased efficiency of the quarantine services, notably at such important ports as New Orleans, Quebec, and New York.

The United States Government, also, has, in recent years, done very much more than ever before for the establishment, equipment, and maintenance of quarantine stations.

A continuance of this work is desirable, but for substantial progress something more than merely continuing the present methods of quarantine is needed. Diphtheria and scarlet-fever should be excluded by quarantines, but the entire country is permeated with those diseases, and with the still more important one—consumption; and a *Health "Department of the Interior"* is needed to be established at Washington, even more than is a continuance of quarantine.

Cholera.—To be forewarned *should* be to be forearmed; but our long-continued immunity from cholera in this country has led to a general belief that there is no longer danger from cholera in the United States—a belief which may be true, but, in my opinion, is not fully supported by facts. The constant presence throughout the United States of typhoid-fever, *a disease which is believed to be spread in almost the same ways in which cholera is spread*, should, it seems to me, teach us more humility as to the assumed sanitary superiority of our people and their surroundings, and should lead us to urge the people to adopt those measures which are now known to be restrictive and preventive of both cholera and typhoid-fever.

It should not be forgotten that our greatly improved systems of quarantine, at our leading seaports, do not yet ensure us against the introduction of cholera in the same manner in which it was introduced in 1873, when three distinct outbreaks of cholera, in widely remote parts of the United States, were traced to the unpacking of personal effects of immigrants—at

Carthage, O., Crow River, Minn., and Yankton, Dak. So long as conditions are permitted to remain which result in the annual spread of typhoid-fever in every State in this Union, there is good reason to believe that cholera would spread if introduced at a season of the year favorable thereto.

It should be, but is not generally understood that there is coming to be a thickly populated area in a portion of this country in which, by reason of alkaline waters, the inhabitants are probably especially liable to typhoid-fever, cholera, or other diseases propagated by micro-organisms which enter the body by way of the alimentary canal, and which micro-organisms are generally destroyed by the normal acid of the healthy human stomach.* It is not probable, but it is possible that if cholera should become once thoroughly established in the warmest portion of the region of alkaline waters in this country, it might possibly find there a permanent home, as it has in the brackish waters of the Ganges in India.

The bare possibility of such a calamity as the permanent addition of cholera to the diseases constantly present in this country should prompt the United States Government to a thorough investigation of the subject, lest, through careless disregard of such duties by the Government, the lives of thousands, perhaps millions, of our people should be jeopardized.

Typhoid-fever.—But, after all, is cholera a more fatal disease or one more to be dreaded than its twin destroyer—typhoid-fever? The number of deaths from typhoid-fever reported as having occurred in the United States during the census year 1880 was 22,854;† and it is probable that not much more than half of the deaths were reported, because the method of collecting the statistics of deaths for the United States census is known to be very defective. We are apt to look with contempt upon the East Indians for living under conditions which permit their destruction by cholera, while at the same time our own people are permitted to be swept off by the thousands in every year by a disease which we believe to be spread in almost precisely the same manner that cholera is propagated, and our National Government is doing absolutely nothing to

* Eighteenth Annual Report of the Local Gov. Board, Eng. 1888-89, Supplement containing Med. Officer's Report for 1888, pp. 517, 521, 524.

† U. S. Census, Vital Statistics, vol. xii., part ii., p. 366.

prevent its continuance, does not even grant to its National Board of Health a dollar to investigate and report on the best methods for the prevention of this great waste of life and treasure that continues to go on, notwithstanding the belief of leading sanitarians that, in great part, it is unnecessary, and might easily be prevented without the use of more money than is annually wasted through preventable sickness from this disease.

I think it is important that the Government should investigate the reason for the prevalence of typhoid-fever and "mountain-fever" in the region of the Rocky Mountains, and especially in the region of alkaline waters. Such an investigation might throw much light upon the subject of the causation and better means of prevention of fevers throughout the entire country.

Causation of Yellow-fever.—Are not all the facts known relative to yellow-fever compatible with the belief that the disease is caused by the inhalation (or otherwise taking into the human body) of the *products* of the growth, reproduction, or life processes of some organism, probably microscopic in size, which organism may not be capable of reproduction *within* the human body, but is capable of reproduction in filth *outside* the body, at high temperatures, but which organism is destroyed by a freezing temperature?

If there is such compatibility in the facts, is it not desirable that the United States Government should take such measures as shall ensure the thorough searching for such hypothetical micro-organism, not in the bodies of yellow-fever patients, but in localities known to be infected?

Is not the importance of this subject, either as affecting the lives of citizens of this country, or as affecting the money interests of our people, sufficient to warrant the employment of a number of investigators and the expenditure of considerable sums of money for investigations in the directions indicated by the facts in the possession of physicians and sanitarians?

It has been found that without the presence of oxygen (as in the human body) the cholera bacteria produce their poison more energetically and more quickly than in the presence of air; but when developed in the absence of oxygen the cholera bacteria are much more sensitive, traces of acid being sufficient to destroy them. When they first leave the body they are, therefore, easily destroyed by the gastric juice in the healthy

human stomach, and cannot reach their habitat in the intestines ; but if developed outside the body, in the presence of air, the bacteria soon become aërobic and not so easily destroyed. This seems to explain why cholera (like typhoid-fever and yellow-fever) is only seldom directly contagious, and why the disease is contracted in an infected locality.* Something similar or analogous to this being true in typhoid-fever, and a noticeable fact in yellow-fever, the facts respecting the cholera bacteria may aid in the search for the specific cause of yellow-fever.

A Possibility of the Prevention of Cancer.—A study of the locations of 7881 primary carcinomata,† as illustrating the probability of a cancerous microbe, has led Dr. Edmund Andrews, of Chicago, Ill., to believe that the facts he has collected and presented make it probable that a microbe exists, and prove the importance of searching out the microbe ; also that much can probably now be done toward preventing this disease, by measures looking to the prevention of access of microbes to those parts of the body most susceptible to primary cancer, especially the lower lip, its liability to primary cancer being " 8448 times greater than a similar area of the intestine." ‡

In this connection may be held in mind an epidemic or out-

* Amer. Jour. Med. Sci., July, 1890, p. 77.

† 1. Other things being equal, primary carcinoma is most frequent on those surfaces which by their position would be most accessible to free swimming microbes or spores derived from without the body.

" 2. The liability to cancer is increased if the epithelial surface is so situated that the spores can remain upon it for at least some hours without being swept away, as on the lower lip ; but the liability is greatly diminished if the parts are frequently swept off, as the globe of the eye by winking, or the oesophagus by swallowing food and drink.

" 3. The liability to cancer is great if the membrane has vast numbers of deep glandular follicles into which the spores can penetrate and lie free from disturbance and have direct access to the more delicate epithelial cells, as at the pyloric end of the stomach and the follicles of the mammary glands.

" 4. Those portions of the skin which are usually uncovered are oftener attacked than those covered with clothing and constantly brushed by its friction. The skin of the face, for instance, produces more cancers than all the covered portions of the integument combined."—Jour. Amer. Med. Assoc., Nov. 23 1889, p. 739.

‡ Jour. Amer. Med. Assoc., Nov. 23d, 1889, p. 742.

break of cancer attributed to the use of cider, in the making of which water from an impure source was used.*

INFLAMMATION—A PROPOSED GENERAL ADVANCE “ALL ALONG THE LINE.”

It is coming to be the belief of physicians, and especially of surgeons, that nearly all inflammations are caused by the presence of micro-organisms. (Some of the most common of these pus-generators are the round ones—the micrococci, sometimes grouped by twos and in chains, etc.—*staphylococci* and *streptococci pyogenes*, three varieties of each, the *albus*, *aureus*, and *citreous*.)

Some of these micro-organisms are now very widely and generally distributed in thickly inhabited places, while in sparsely inhabited regions, especially in mountainous regions, they are not so generally found. I think we should put with this fact another one—that most new States and localities are, apparently, good health resorts. I remember well that, many years ago, certain States in this Union were considered exceptionally healthful as regards diseases of the lungs, while now the mortality statistics in those States show the greatest proportion of the deaths to be from diseases of the lungs. Part of this change may be due to a change in the average age of the inhabitants, but I think a part of it is due to the fact that the microscopic causes of inflammations have constantly been increasing, so that now the carpets and upholstered furniture in most residences, the floors of most public assembly rooms, the clothing, hair, beard, and hands of most of the inhabitants are infected with these microscopic causes of inflammation.

The surgeons have been acting upon this comparatively recent addition to our knowledge, and to those of us who practised surgery only as long ago as during the late war, the successes in recent surgery are marvellous. Not long since I listened to the recital of the details of fifty-two successive surgical operations, each involving the opening into the abdominal cavity, and each was successful. My belief is that much of such wonderful success as is now achieved by the leaders in surgery is due to the advance of our knowledge upon what

* Science, vol. xiv., No. 342, Aug. 23d, 1889, p. 129.

was formerly known as "The Germ Theory of Disease," which gave rise to what was known as "Antiseptic Surgery," which is now giving place to what is known as "Aseptic Surgery"—the septic micro-organisms are now kept out of wounds, pus does not form, inflammation does not occur, the wounds heal, and the patient recovers.

What I am about to propose may seem to some of you at first as Utopian, but I hope to be able to enlist your enlightened sympathies in the direction of a movement designed to do away with all inflammatory *diseases* of man, in a manner analogous to what has been done by the leading surgeons in doing away with inflammations following surgical operations. Let us glance at the stupendous character of the suggestion, to gradually but eventually do away with all inflammatory diseases! No more consumption, pneumonia, bronchitis, laryngitis, pharyngitis, tonsillitis, rheumatism, and other diseases, including nearly all the dangerous communicable diseases!

So far as relates to the dangerous communicable diseases, such as small-pox, scarlet-fever, and diphtheria, sanitarians now know how to restrict, and perhaps to stamp out, most of them, and they are doing this as fast as they are supported in doing it by governments; but the measures I have to suggest would, I think, tend to aid greatly in that work, and, in addition, would aim to *place at once all inflammatory diseases on the list of preventable diseases*—diseases which we think we know how to prevent just as soon as the people generally shall come to understand the methods proposed, and shall generally co-operate in the employment of those methods.

Without elaboration I hold clearly in mind methods which, if adopted, would, I think, probably be effective, but the statement of them cannot be attempted here. Among the most important measures would be the disinfection of all sputa, pocket-handkerchiefs, and the like. My proposition may be put in the form of preamble and questions, thus :

Since nearly all suppurative inflammations are breeding places for micro-organisms which, when they gain entrance into another living body (or into another weak or injured spot in the same body), are capable of again starting the inflammatory process, therefore,

Should not all purulent discharges and all pus which is accessible be destroyed or disinfected? Should not the aim be thus to restrict the spread and eventually to stamp out all inflammation?

Immunity through inoculation of attenuated virus, albumins and ptomaines:

It has long been known that all animals constantly give off poisons which, if accumulated, are fatal to their own existence.

Certain vegetable ferments which produce alcohol are said to be rendered inactive by the presence of no more than two per cent of alcohol.*

Pasteur says : " Many microbes seem to give rise in their cultures to substances which have the property of being harmful to their own development." †

There seems to be a universal law that all living organisms form poisons to themselves, and there is good foundation for the hope that there may be found methods of using those poisons for the destruction of those micro-organisms which cause diseases of man, or otherwise for the prevention of those diseases.

Immunity against Rabies.—Professor Welch says : " There can be no doubt whatever that it is possible to render animals immune against rabies, both before and after inoculations which would otherwise cause the disease. The independent and careful experiments of Ernst in this country are free from

* Immunity through Leucomaines—by Eusebio Güell Bacigalupi, Translated from the Second French Edition by R. F. Rafael, M.D., J. H. Vail & Co., N. Y., 1889.

† *Comptes Rendus, Seance du 25 October, 1885, p. 771.* M. Pasteur said :

" As far back as the year 1880 I had instituted research in order to establish the fact that the microbe of chicken cholera produced a sort of poison of this microbe."

" One would say that, immediately, there springs into existence a product which arrests the development of the microbe, whether cultivated in contact with the air or in a vacuum.

" Mr. Raulin, my former assistant, to day professor to the Faculty of Lyons, has shown, in the remarkable thesis which he sustained at Paris, March 22d, 1870, that the vegetation of the *Aspergillus niger* develops a substance which arrests, in part, the production of this mould when the nutritive medium does not contain salts of iron."

all partisan bias, and have fully confirmed the statements of Pasteur and others upon this point." *

Professor Henry Sewall, of the Michigan University, has demonstrated the possibility, through injection of snake poison, of rendering the organism immune to the bite of the rattlesnake. †

The experiments and practices of Pasteur and others, for the purpose of securing for mankind immunity from dangerous communicable diseases, through the inoculation of the body with the attenuated virus of such diseases, have, for several years, kept this subject before the people, and there has seemed ground for the hope that eventually success would crown the efforts being made in this direction, and if once the principle is learned with reference to one disease then there is hope with reference to the other diseases. But nearly all such efforts have been made by individual workers, at their own expense, and in such irregular times as they are able to take from their regular avocations by which they maintain themselves; a few workers have been employed by governments, but there is no such governmental support of such investigations as the immense importance of the subject demands, and especially not in our own country. The United States Government can be commended for what it does in this direction relative to the health of *domestic animals*, but what *can* one say by way of apology for a government that appropriates hundreds of thousands of dollars to study the causes of diseases and to protect the lives of domestic animals, and then fails to appropriate as much to do a similar work for the lives of the people? I wish, however, to commend what has already been done by the United States Government.‡ I have already mentioned what it has done for quarantine; but I believe there is promise of great good to the human species as a result of the governmental researches into the causation of diseases of animals. The work of Drs. Salmon, Smith, and Schweinitz, of the United States Department of Agriculture, looking to the production of immunity in animals exposed to hog cholera,

* William H. Welch, M.D., Trans. Md. Med. and Chirurg. Fac., 1889, pp. 170-71.

† Mentioned in British Med. Jour., November 29th, 1890, p. 1264.

‡ Jour. Amer. Med. Assoc., July 5th, 1890, p. 1.

has added greatly to our knowledge of the underlying principle in the production of immunity to dangerous communicable diseases of animals and of man.

Dr. Welch has said : "That immunity against infectious diseases may be secured by the injection of chemical substances produced by the growth of specific bacteria was demonstrated first by Salmon and Smith in the case of hog cholera, and has since been demonstrated by Roux and Chamberland for malignant oedema, and by Wooldridge for anthrax,"* both dangerous diseases of man as well as animals.

Published accounts of experiments by Dr. Schweinitz† and also by Frederick G. Novy, Sc.D.,† at the Michigan State Laboratory of Hygiene, indicate that by the inoculation of an animal with the albumins and ptomaines formed in culture-liquids by the life processes of the germs of hog cholera, the animal becomes insusceptible to hog cholera, whether exposed to the disease by inoculation or by direct contact and association with animals sick with the disease. Dr. Schweinitz was even able to produce immunity in an animal by inoculation with a pure chemical prepared synthetically in the laboratory. The results of these experiments are in harmony with facts already known. The substance used by Dr. Koch for the eradication of consumption is not yet made known, but it may be expected to be in line with those facts. Perhaps the term "attenuated virus" may still be used if we consider that the "attenuation" consists in the destruction of the germ, and in the saving of its products for use in the production of immunity. Of course much remains to be done before this knowledge can be made directly available in the prevention or restriction of dangerous communicable diseases of man, and the sooner that work is done the sooner the thousands of human lives now lost through those diseases may be saved. Such work is for the general good, and should be done by the General Government. It should be done with reference to diseases of man, and not be confined to diseases of animals, nor even to diseases which, like rabies, affect man and animals.

Is it not time that human life should be recognized as a

* William H. Welch, M.D., Trans. Md. Med. and Chirurg. Fac., 1889, p. 172.

† Med. News, Phila., Sept. 6th, 1890, pp. 231-39, and Oct. 4th, 1890, pp. 332-35.

proper object, and the most important object of solicitude on the part of the National Government of the United States?

It will be a great gain, however, if it can be brought about that the Government shall do such work even if only for the saving in money values to the people, which undoubtedly would be immense.

Antidotes to Diseases already Acquired.—At the recent International Medical Congress in Berlin, Dr. Koch, of the Imperial Board of Health, referring to his now famous consumption cure, said : “ My researches on this substance, therefore, although they have already occupied me for nearly a year, are not yet completed, and I can only say this much about them, that guinea-pigs, which, as is well known, are extraordinarily susceptible to tuberculosis, if exposed to the influence of this substance cease to react to the inoculation of tuberculous virus, and that in guinea-pigs suffering from general tuberculosis even to a high degree, the morbid process can be brought completely to a standstill without the body being in any way injuriously affected.” . . . “ This opens up an oft-promised field of work, with problems which are worthy to be the subject of an international competition of the noblest kind.”

Dr. Koch said : “ Allow me, therefore, . . . the expression of a wish that the nations may measure their strength on this field of labor and in war against the smallest but the most deadly foes of the human race ; and that in this struggle for the weal of all mankind one nation may always strive to surpass the other in the successes which it achieves.” *

Certainly we can all join with Dr. Koch in such wishes for national effort for life-saving work, but I think that, among all the countries represented at the International Congress, there are few governments which occupy such an enlightened position on the subject of sanitary researches as does the German Empire. If our own National Government would even do as much as to publish and thoroughly disseminate among our people the important results of the researches made by the German Imperial Board of Health, our people would have cause to rejoice, and probably thousands of human lives would be saved through the knowledge thus obtained. Something

* Jour. of the Amer. Med. Assoc., vol. xv., No. 10, Sept. 6th, 1890, p. 370.

in the direction of such publication has recently been done by the United States Marine Hospital Service. But much more than has yet been attempted should certainly be done in that line. And if our Government were to wake up to the importance of doing what the highest interests of its constituents demand—cause researches to be made for the creation of such knowledge—it can find as bright intellects and as faithful workers among our own scientific men as there are in any country ; and in a short time the world might be as much indebted to the United States Board of Health for life-saving knowledge as it now is to the Imperial Board of Health of Germany.

While we accord great honor to Dr. Koch, who discovered the specific cause of consumption, and who now thinks he has discovered its antidote, let us not forget that it was an honored member of our own Association, our President in 1887, Dr. Sternberg, of the United States Army, who first discovered the specific cause of pneumonia—a disease which as a cause of mortality in this country ranks only a little lower than consumption ; and, if the subject were followed up, it should yet yield results somewhat comparable with those reached by Dr. Koch with reference to the somewhat similar disease which he seems to have conquered.

Let us consider for a moment the prospective importance of such a discovery as that suggested by Dr. Koch. It is not claimed that all deaths are reported in this country, but the reported deaths in the United States from that one disease—consumption—in the single census year 1880 were 91,270 ; without doubt more than 100,000 such deaths occur in the United States in each year. If, as stated by Dr. Koch, “in guinea-pigs suffering from general tuberculosis even to a high degree, the morbid process can be brought to a standstill without the body being in any way injuriously affected,” there is certainly ground for the hope that something approaching that can be done for the human being, and that, if sufficient intelligent effort be put into the research, the substance which will do this can be found, even if it has not already been found by Dr. Koch. Let us suppose that our own National Government were to pay for such researches, and that annually the lives of one half or even of one fourth of the 100,000 of our people, who otherwise would have prematurely died, were to

be saved. How would that compare with the work of the Agricultural Department of our Government for the distribution of garden seeds? How would provision for such work by Congress compare with its work for the protection of our infant industries? How would it compare with any work that has been done by Congress during the past twenty years? I admit that in 1879 it established a National Board of Health, but the Government failed to sustain the Board long enough to permit of many such researches as those I suggest, although, so long as it was sustained, it did excellent work.

In comparing public health work with the work of the United States Agricultural Department, I do not forget that "that art on which a thousand millions of men are dependent for their sustenance, and two hundred millions of men expend their daily toil, must be the most important of all—the parent and precursor of all other arts." *

But all must concede that agricultural art has now made such wonderful progress that there is no longer need for more to fully sustain not only the necessities of man, but to supply many luxuries. Superfluous effort, therefore, might well be diverted from agriculture, to supply those provisions for public health work for the want of which hundreds of thousands of our people actually prematurely perish, and hundreds of thousands more drag out a miserable existence.

So many of our people are now raising farm products that that is claimed to be a comparatively unprofitable occupation.

Apparently, then, this country now needs fewer farmers, more sanitarians.

We welcome to our ranks, however, not only farmers, but all good people.

They have Departed, but their Works Continue.—Custom and humanity dictate that there shall be public recognition of the services of those who have publicly labored with us, and who have ceased their labors, but whose good work will go on down through the ages. Considering our numbers and the average age of our members, it is to be expected that in every year death will overtake some of us. Before the time for our next meeting some of us will have passed over to the "great ma-

* James F. W. Johnston.

jority." Since the last meeting, so far as I know, only three of our members have died : Dr. Charles Linnæus Allen, Secretary of the State Board of Health of Vermont, who was elected a member of this Association in 1888 ; Dr. J. H. Baxter, Surgeon-General, United States Army, a member since 1876, and Dr. William Brodie, President of the Board of Health of Detroit, Mich., a member since 1873. Dr. Brodie had long been a prominent member of the medical profession ; he had been President of the State Medical Society of Michigan, and President of the American Medical Association. It was largely through his work that this Association held its successful meeting in Detroit in 1883. Dr. Brodie was President of the first Sanitary Convention held under the auspices of the Michigan State Board of Health.

I trust that a committee or the Secretary of this Association will make fitting records of the services of our deceased brothers, and of our tributes to their memory.

Dr. Ira H. Bartholomew, a former member of this Association, died at Lansing, Mich., October 18th, 1889. He was a prominent member of his profession, had been President of the Michigan State Medical Society, and was a close student of social science. As his student, partner, associate, and friend, I wish to record the fact that (two years after some of us had made an unsuccessful effort) it was due to his efforts, about eighteen years ago, while he was a member of the Michigan State Legislature, that the Michigan State Board of Health was established.

Death of Sir Edwin Chadwick.—Since our last meeting sanitary reform has lost an able advocate in the death of Sir Edwin Chadwick in England. In recording his death, the *British Medical Journal* said : " Few men have deserved better of their country than the veteran sanitarian whose death, at the advanced age of ninety-one, we have to record. His investigations of the sanitary condition of London, dating back to 1847, were the official starting-point of a reorganization of the Health Department, and laid the public legislative basis of the first of a series of sanitary reforms, which have been of inestimable value during the last half century in the saving of life and diminution of sickness and disablement. His subsequent services to the cause of army health reform, and his

continuous devotion to great and small questions of public and personal sanitation, placed him quite in the first rank of non-medical sanitary reformers." . . . "It has been aptly observed that had he, as a military man, succeeded in destroying one hundredth part of the lives which he was prominent in assisting to save, his statue would have been erected long since in more than one of the great cities of the empire, and he would have been loaded with honors and titles. As it is, it was not until he attained the age of ninety that he received the honor of knighthood." *

Practical Application of Sanitary Science.—I have already touched that subject which was declared the second object of this Association, but mainly to show that the most rapid advancement of sanitary science is made, and is to be expected, where governmental aid is most complete and abundant; in other words, where the people as a whole contribute, according to their means. Having left the subject of advancement of science, I will briefly consider such "organizations and measures for the practical application of public hygiene."

State Boards of Health.—There is reason for a high degree of pride in the wonderful development in this country of the State Boards of Health. Although none of them have anything approaching the resources which are placed at the disposal of the Imperial Board of Health of Germany, or of the Government Board of England, and it must be confessed that the debt which humanity owes to Dr. Robert Koch, of the German Board, is perhaps greater than to any man in this country, in any field of human effort, still I think it can fairly be claimed that some of the State Boards in the United States rival the boards of health in the general governments of the most enlightened countries in the world—rival them in the amount of useful services which they are continually performing for their own people and for the general sanitary enlightenment of the world; especially do they rival them in the immediate practical results of their work.

For instance, statistics which appear to be trustworthy seem to prove that in one State, and apparently through measures inaugurated and maintained by the State Board of Health,

* British Medical Jour., No. 1541, July 12th, 1890, p. 96.

the deaths from small-pox have been so reduced that more than 1500 persons have continued to live who would have died from that disease if its mortality rate had continued as it was before the establishment of the State Board of Health. One thousand five hundred lives saved from small-pox means a saving also of at least 6000 cases of sickness from that loathsome disease.*

In that same State, also, the vital statistics seem to prove that through similar though not identical work there has already been a saving of life from scarlet-fever equal at least to 5000 persons, and (if the death-rate was 10 per cent) a probable saving of 50,000 cases of sickness from that disease.†

Nor is this all; statistics indicate that at least *one life a day is being saved* in that State by measures started and maintained by its State Board of Health for the restriction of diphtheria.‡ As the death-rate is about 24 per cent, at least 1521 cases of sickness from diphtheria are prevented annually.

At least one other State (Massachusetts) has undertaken statistical effort to learn the effect of such work, and similar saving has been made apparent.

It seems desirable that other States, in which similar work has been done, should collect and publish evidence of the results of their work.

The Value and Importance of Statistics.—On many questions of public policy, no useful conclusion can be reached without a thorough knowledge of the facts involved; and frequently it is important to have accurate knowledge respecting several classes of facts. For instance, in order to know what disease it is most important that we shall strive to prevent, it is necessary to know what disease causes the most deaths or the most suffering among the people. Mortality statistics supply this knowledge. Again, in order to know whether a disease, which is an important cause of death, is itself caused by climatic or meteorological conditions, it is necessary to have, and to compare with the statistics of deaths and of sickness, other statistics relating to the various meteorological conditions.

For several years we had at Washington a United States

* Proceedings of Sanitary Convention at Vicksburg, Mich., 1889, p. 56.

† *Ibid.*, p. 58.

‡ *Ibid.*, p. 62.

Commissioner of Labor, and he has collected valuable statistics on the various branches of the subject of human labor. We ought to have at Washington an officer charged with the duty of collecting statistics relating to those subjects which bear directly upon human life and health.

There is now a "Department of Labor" in the United States Government. Should there not be a "Department of Life and Health"?

Statesmanship.—This is an age of organizations among the people for the general benefit of all. People generally are coming to have that degree of intelligence, education, and culture, which fit them for self-government. The daily papers, the magazines, the excellent postal facilities, the telegraph and the telephone, have served greatly to equalize the intelligence of the people generally; they have served greatly to do away with famines, with continual warfare, and, I believe, with great wars, and certainly they have done much to make the old-time plagues and pestilences horrors of the past.

Yet, although the general governments of countries are making progress toward conforming to the actual conditions among the people, old customs and precedents have a powerful influence in restraining progress; and I think this is more noticeable to members of this Public Health Association than to any other class of people, for the reason that sanitary science is a comparatively new science, and has not for so long a time been available for spreading its knowledge among the people. But already the leading minds in several of the most civilized countries have recognized the fact that the greatest good to the greatest number of citizens consists, first of all, in securing to them life and health. Thus, for instance, Disraeli said that action in this direction "is the wisest statesmanship." Gladstone has expressed himself similarly. And through the lead of such statesmen England has its useful general board of health, the "Local Government Board," with its corps of medical officers. Some of the important work of the German Imperial Board of Health is well known.

In our own country, the framers of the Declaration of Independence declared that "life, liberty, and the pursuit of happiness" are "among the unalienable rights," to secure which "governments are instituted among men."

In times past the minds of men and of governments have been kept so occupied with protecting the lives of their citizens from the dangers caused by the battling of other men, hostile tribes, and foreign governments, that little time or energy has been left to devote to the protection of life and health from ordinary preventable causes of death and sickness. Now that men and nations are coming to be less destructive of each other, it is rapidly coming to be seen that by organized effort and general co-operation a great proportion of the premature deaths, and of the sickness from the most common diseases, and the resulting pauperism, insanity, and crime, can easily be prevented, and this without any radically new principle of government, but by an extension of the principle of protection of life and liberty into new systems of effort. The Constitution gives Congress the power to "provide for the common defence and general welfare of the United States."

It is the same now as when the Book of Hosea was written —our "people are destroyed for lack of knowledge,"* and a government has only to collect, search out, and disseminate among its people "knowledge" of the causation of disease, its modes of spread, and how to avoid causes of deaths and the spreading of epidemic diseases, to make it possible for its people to have safety to "life" and that "pursuit of happiness" which is only possible to persons in health. This implies, however, that the Government must constantly maintain statistical investigations and scientific researches into the causation of diseases, and such a complete and thorough system of prompt notification of the outbreak of every dangerous communicable disease within its own country, and also in all parts of the world where it may readily spread to its own country, that the government shall be able to and shall in fact promptly warn all its people endangered, and not only warn them, but shall at the same time place before them the best that is known or can be learned concerning the exact methods for avoiding the dangers to life and health from that particular disease which at the time is threatening.

Only by some such modification of governmental methods is it possible to do for a people that service which it is the highest function of a government to perform.

* Hosea, Chapter iv., verse 6.

We hear much about the wisest statesmanship as applied to such questions as relate to our commercial dealings with other nations—questions whether it is wiser to have “ free trade” or “ protection” of home industries, yet these are questions of small consequence to the people of any country when compared with questions which involve the protection of the lives and health of the people themselves ; because the people can get sufficient food and other necessaries for subsistence under “ free trade” or under “ protection ;” but under neglect of proper governmental protection of life and health a large proportion of the people prematurely die, and still larger proportions suffer sickness, lifelong pain, and physical and mental degradations, from causes which under proper governmental protection are easily preventable. That this is true, there is no longer question ; incontrovertible facts are on record proving that it is strictly true. As soon as this knowledge comes to a majority of the people, they will surely demand that the government shall no longer neglect its highest functions ; and we may confidently look forward to a “ good time coming,” when the *safety of life to our people* shall be the first and most important concern of the enlightened Government of these United States ; when the most important officer in this country, whether he is called Commissioner of Health, Secretary of the Health Department, or President of the United States, shall, at all events, be its wisest sanitarian, or at least its most competent public health administrator. And you, the members of this Association, are and should be laying the foundations, and fitting yourselves for the performance of such highest and most sacred duties ; for in these days of rapid advances in the spreading and equalizing of knowledge, we know not how soon the clamor of our people for the protection of their lives may force upon our own National Government the proper performance of its highest duties, which it has so long neglected.

A BLESSING IN DISGUISE.—The influenza epidemic, says the *Tropical Agriculturist*, may prove a blessing in disguise in teaching the English people the value of quinine ! And states that, according to the annual report of the Bengal cinchona plantation and factory for 1889, part of which is extracted in

the new *Kew Bulletin*, the chief cause of the extraordinarily low price of quinine and other cinchona alkaloids for some time past is the immense exportation of the bark from Ceylon. During the year ending September 30th, 1880, 1½ million pounds of cinchona bark were exported from Ceylon to London. In 1883-84 the quantity rose to 11 million pounds, and in the succeeding year was about the same. In 1885-86 and 1886-87 the exports amounted to 15 and 14 million pounds respectively, while in 1887-88 they fell to about 11 millions. The explanation of the decline is that when cinchona began to fail from disease and depreciation in quality, the Ceylon planters turned their attention to tea with so much energy that they cut down their cinchona trees to make way for tea bushes, and not being able to hold their bark, they sold it in the London market for what it would fetch. The result has been an enormous fall in price, to a figure far below anything previously heard.

"The efforts of Great Britain and Holland to secure for their tropical subjects a cheap remedy for the commonest of all tropical diseases have thus culminated in a more triumphant success than was ever anticipated. But this state of affairs cannot last much longer. Ceylon planters will not go on planting cinchona trees to sell their product at a loss. As a matter of fact, planting has already ceased, and the exportations are beginning to diminish. And in the course of a year or two the price of cinchona products must rise." Hence importance is attached to a new process of manufacturing sulphate of quinine, called the fusil-oil process, invented by Mr. Wood, late quinologist to the Bengal Government, of which a description is contained in the same report. Mr. Wood claims that by it—(1) the alkaloids are completely extracted from the bark in a much greater state of purity, so that the final operations for obtaining pure and finished products are much simplified ; (2) that the whole process of extraction can be performed at common temperatures ; (3) that the appliances are all of a simple character, and therefore well suited for plantations ; and, finally, that quinine can be produced at a cost not exceeding the present unprecedentedly low market price. The last point is probably that which has most practical interest for the general public.

TRANSACTIONS OF THE SEVENTH ANNUAL
MEETING OF THE AMERICAN CLIMATOLOGI-
CAL ASSOCIATION, HELD AT DENVER, COL.,
SEPTEMBER 2, 3, AND 4, 1890.

REQUISITES FOR A CLOSED SANITARIUM IN
COLORADO.

By J. H. KELLOGG, M.D., of Battle Creek, Mich.

IN the few weeks which have elapsed since I received from your President an invitation to prepare a paper upon the above subject, my time has been so thoroughly occupied by the professional and administrative duties incident to the care of a sanitarium with more than four hundred inmates, that I have found it impossible to give the amount of time to the preparation of this paper which the subject demands, and have only attempted to give, in what I fear is rather crude form, certainly without any attempt at literary finish, the result of my experience during the last fifteen years in undertaking to build up a sanitarium upon rational principles. I was led to undertake this work partly by a remark made many years ago by Dr. S. Weir Mitchell, in an address before the American Medical Association, to the effect that he recognized a large class of chronic invalids who could only be treated in a properly conducted sanitarium, but that, unfortunately, he knew of no such institution in the United States under scientific management. I determined to undertake the task of supplying this want, and in my efforts in this direction have endeavored to avail myself of such knowledge as could be obtained by observations in the leading hospitals and other medical institutions of this country and Europe.

I shall present in this paper an outline of the ideal conception of a scientific sanitarium which I have formed, and which I have earnestly endeavored to embody in practical form, so far as natural conditions have rendered possible, adding some points which it seems to me are especially essential for an institution located in Colorado.

The first thing essential for such a medical establishment as this paper contemplates is a true conception of the purpose of a sanitarium. This involves an appreciation of the relation between health and disease, getting sick and getting well, and of the relation which the physician and his art should sustain to the sick. As Professor Bouchard has well said : “*Nous vivons dans un temps où il est bon de vivre, quand on s’interesse aux choses de la médecine.*” (“To one interested in things pertaining to medicine, the present is a good time in which to live.”) Within the last twenty-five years medicine has made more progress in those lines, the development of which may some time render it worthy to be called a science, than in as many centuries previous. The field of medical thought has been so covered with the fragments of medical idols and fetishes, cast down from the shrines where they have long received homage, that to some minds the perspective has doubtless revealed naught but chaos, and the iconoclastic clatter presents to such ears only a confused and senseless jargon. But one to whom the study of medicine is an investigation of principles rather than a mere collection of formulæ sees rising from the tombs of the ancient dogmas and superstitions which constituted the empirical medicine of the past, the form of a new science—rational medicine—surrounded with a light whose brilliancy illuminates the dark recesses of etiology, and reveals a pearl-covered bottom in pathological depths hitherto regarded bottomless. Such a one is able to distinguish, rising high above the Babel of confusing and incoherent controversy, the clarion voice of Truth proclaiming a new gospel, or rather the resurrection of an old medical faith, the foundations of which are old as Æsculapius and Hippocrates, though long covered up with the rubbish of mediæval philosophy.

The sanitarium is a product of modern medical progress, and ought to represent rational medicine in its most advanced and most progressive form. The central and fundamental idea in such a place should be the thought that health-getting is not a matter of magic nor of pill-swallowing, but, rather, a matter of education. The average chronic invalid is sick because he has neglected to supply the conditions requisite for health, or because he has, by long-continued addiction to bad habits, trained some of his bodily functions or structures into

ways of bad behavior. The cure of such a patient must consist chiefly of a course of systematic training by which he will be educated out of bad ways into better ones. This course of training must include such a discipline as will influence every disordered function. It will involve an absolute control of the invalid's entire regimen. His whole course of life must be systematically conformed to such rules as will efficiently and curatively modify disordered processes. Health is a matter of growth and development akin to the growth of a tree. By modifying his nutritive processes, the chronic invalid may be grown out of disease into health. By raising his whole vital status, improving his general physical tone, the morbid conditions are left behind, the normal vital rhythm is established, and health comes, not by a process of ingenious antidoting by the administration of physic, but as the result of the working in the body of that occult force recognized by the ancients, but apparently almost forgotten in modern times, the *vis medicatrix naturæ*. For nearly two thousand years medical men have occupied the greater share of their time in searching for medical specifics or antidotes for human maladies. Rational medicine teaches the physician to direct his attention to the patient rather than to his malady. It is the patient we must seek to cure and not his disease. Cure the patient and the disease has vanished ; but, on the other hand, one may cure the malady to his satisfaction while leaving the patient worse off than before. "Cured to death" might appropriately be written on many a death certificate, when more attention to the patient and less to his disease, more thought about regimen and less of medication might have rendered a death certificate unnecessary. A sanitarium, then, ought to be a place where health is cultivated, where the sick are reformed from their unhygienic modes of living, and taught to do works of supererogation healthward. The nerves must be trained to self-control. The neurasthenic must be taught how not to squander nervous energy, and how to cultivate nerve tone. The hysterical and the hypochondriacal must be shown the injury arising from introspection and self-centring of the mind, and must be cajoled into a healthy activity of mind and body. The man with a weak stomach or a weak liver must be taught how to give his stomach or his liver an easy time. The

chronic pill-swallower must be weaned from his doses. The peripatetic valetudinarian must be enthused with an ambition to become something better than a museum of maladies, and must be jostled out of his invalid ruts. The woman who takes an inventory of all her symptoms every morning, lest one should have escaped over night, must be inspired with a wholesome hatred of disease, and an earnest determination to escape from its thraldom. The whole place must be filled with sturdy ideas about health and wholesome living. The very atmosphere must breathe of health, and every room must be illuminated with mental and moral sunshine.

So much for general principles. Now let us come to particulars. The material conditions of a sanitarium must be of the most healthful character. It must be well located. Its site must be such as will secure in its vicinity a dry and well-drained soil and good air, free from smoke, dust, malaria, and poisonous emanations of every sort. The climate must be adapted to the class of patients to which the institution is especially devoted, or if all classes are received, excessive heat and dampness are qualities the least to be coveted. For pulmonary cases, a cool, dry climate is especially to be desired, and, indeed, the same might be said of a large proportion of all classes of invalids. I have long been satisfied that equability of climate is by no means to be so much desired as is generally supposed. The dead level of perfect climatic equability results in a loss of that power of adjustment to changing meteorological conditions, which is one of nature's most effective means of defence against perturbing influences of many sorts. A cold snap is the best of tonics, a sort of vital gymnastic which jostles the flagging energies into renewed activity and cultivates in the body the power of self-defence.

As regards location, it is always highly desirable that facilities should be afforded for pleasant walks and drives in the immediate vicinity. Easy mountain climbing is an exercise of great value, in the absence of which, however, the treadmill may be used as a prosy substitute.

Given a proper location, the construction of our building is of first consequence. A building is wholly unfit for a sanitarium, unless it has been constructed with special reference to the purpose of such an institution. The word *sanitarium* has

almost lost its significance through the abuse to which it has been subjected in being put up as a sign over almost every little hotel or tourists' resort, which, failing of financial success, has adopted this means of capturing invalids. The ruse does not always work, however, as I found a few years ago, when on a visit to Florida for the purpose of studying the advantages of that State as a place for a winter sanitarium. I found a small hotel which had been obliged to abandon the scheme referred to, owing to the fact that the negro runners who swarmed about the depot on the arrival of trains, insisted on shouting at the top of their voices, "All aboard for the cemetery," a corruption of the word *sanitarium* which was more appropriate than profitable to the proprietor. Our building may be constructed either of wood, brick, or stone; but it must have hollow walls, and the more nearly air-tight the walls are the better. Rooms must be of sufficient size, and the building must be so planned and placed as to secure the largest possible amount of sunlight for sleeping-rooms. Floors should be of hard wood, not carpeted, rugs being employed wherever floor covering of any sort is needed. Wide balconies commanding beautiful landscape views are of great service. Sewerage and plumbing must be most carefully planned and executed. No stationary wash-bowls or closets should be allowed in sleeping-rooms. Such conveniences should be placed in as isolated a manner as possible, and the sewer should be so thoroughly ventilated as to prevent any accumulation of sewer gas.

VENTILATION.—The ventilation of a building designed for a sanitarium or for a hospital is a matter of the utmost importance. The arrangements for the supply and warming of fresh air should be such as to make their action automatic and continuous. Fresh air should be admitted to the halls and taken thence to the rooms, from which it should be carried out by a separate foul-air duct leading from each room directly through the roof. Five or six thousand cubic feet of air per hour is not too great an allowance for invalids. This amount may be easily secured, and without drafts, by the proper placing of inlets and outlets.

Ventilating fans of the disk type, capable of handling large

volumes of air without too great velocity, are of great service, especially as a means of combating the influence of adverse winds.

WATER SUPPLY.—An abundant supply of pure water is essential. The best water for the purpose of a sanitarium is one which is as free as possible from foreign matters of any sort. The greatest possible freedom from organic matter is absolutely necessary. A small amount of inorganic matter, such as salts of lime, may be tolerated, but the absence of even these is rather to be desired than otherwise. Even distilled water has decided advantages for certain classes of invalids. Certainly such water as has been appropriately described as having “a taste of the sea and a smell of perdition” is not to be commended for the use of a sanitarium.

FACILITIES.—The word *sanitarium* or *sanitorium*, in its original application, meant simply a resort for invalids, and comprised nothing more than a comfortable home in a salubrious climate. In its modern use the best representation and ideal sanitarium must be more than this. It must be equipped with facilities for the employment of all rational remedies which may be usefully employed in the treatment of disease, special prominence being given in a sanitarium for Colorado to such as are applicable to the treatment of pulmonary diseases. In harmony with the idea that nature is the great curative force, and that a sanitarium should be a place for training the individual out of disease into health, it is evidently necessary that such an institution should be provided with most ample and most excellent facilities for the employment of such natural agencies as water, air, sunlight, electricity, and exercise, together with mechanical and instrumental appliances of every useful sort. Ample bathing apartments should be provided in which facilities will be afforded for the employment of hydro-therapy in every form—not only full baths, but sprays, showers, douches, vapor, and Turkish baths, as well as all the minor applications of this valuable therapeutic agent. A tuberculous patient will not bear too free use of water, especially at extreme temperature, but under discreet management there is no one agent of greater value in the treat-

ment of tuberculosis, and none which is more indispensable in the management of many other forms of tuberculous diseases than this agent, which has often been brought into disrepute by indiscreet or empirical use. When used with due regard to the patient's condition, and with a thorough appreciation of its potency for mischief as well as for good, water becomes an agent of the greatest utility in the management of a large number of pulmonary cases.

Special attention should be given to the ventilation of bathrooms, the air of which is peculiarly likely to become exceedingly foul, unless such attention is given to this matter. My rule has been to supply a sufficient quantity of air to bathing apartments to give each patient at least eight thousand cubic feet of air per hour. This amount is necessary to maintain the high degree of purity essential to health, and to prevent the exhaustion often experienced by a person whose lung capacity is limited, as the result of spending an hour in a close, unventilated bathing apartment, the good effects which might have been obtained from the treatment administered being thus more than counteracted by the depressing effect of the poison-laden atmosphere.

Facilities for the employment of electricity in all useful forms are essential to a well-equipped sanitarium. I have for fifteen years made use of electricity in this class of cases, employing various forms of current—galvanic, faradic, dynamic, and static, and with good results. Faradic electricity is of great value as a means of strengthening the respiratory muscles. Galvanism applied with large electrodes and high doses is an excellent means of stimulating the absorption of inflammatory products as the result of pleuritic or parenchymatous inflammation of the lungs, and it is also useful as a means of stimulating the absorption of fluids in the chest cavity. A galvano-cautery is indispensable in the treatment of nasal and pharyngeal troubles, and electrolysis may also be employed in the removal of neoplasms of the nose and pharynx. From some experiments which I have made I believe that the galvanic current may be usefully employed in connection with the wheatstone bridge and the potentiometer, as a means of exact diagnosis in the treatment of some forms of intrathoracic disease, as well as in cases of morbid growths of the abdominal

cavity, through the difference in electrical resistance shown by morbid and healthy tissue.

I am sure that the lack of appreciation of electricity as a therapeutic agent, especially as regards the galvanic current, is due to inattention to proper dosage, and especially the employment of too feeble currents in cases in which strong currents should be used. Galvanism can only be used properly by the aid of the milliamperemeter, and I also find the coulombmeter of value as a measure of the amount of work done.

Static electricity is one of the best means of relieving the nervous symptoms from which phthisical patients suffer. My acquaintance with this climate is not sufficiently intimate to enable me to judge of the relation the considerable electrical disturbances to which it is subject may bear to the human system, or what relation electrical changes in the atmosphere may bear to the treatment of disease; but from observations elsewhere, I believe that such atmospheric changes do affect, unpleasantly, persons who, by constitutional idiosyncrasy, or as the result of morbid physical states, are abnormally susceptible to variations in electrical potential. Possibly static electricity may prove an excellent means of combating this influence.

I have for many years employed an alternating dynamic current as a means of exercising the muscles of respiration as well as other muscles, and find this variety of current exceedingly useful for this purpose, as very vigorous contractions of the muscles can be obtained without the slightest pain, or no other sensation than that produced by muscular action.

The galvanic current is also a most excellent means of relieving pleuritic pain, intercostal neuralgia, and other pains which accompany affections of the chest.

The electrical department of a sanitarium should include, in addition to portable faradic and galvanic batteries, a dynamo capable of producing a current of at least ten ampères, and an electromotor force of one hundred volts. A small alternating current dynamo, a storage battery for use in connection with a large dynamo, a large static electrical machine, rheostats, milliamperemeters, and other instruments for electrical measurements, appliances for galvano cautery and electrolysis, and, with the rest, a good medical electrician, capable of making a

proper use of the various appliances, and of keeping them in perfect order.

The future possibilities of this agent in the treatment of pulmonary diseases seems to me to be very great. Judging from the results which have been obtained in the treatment of other morbid conditions, there is good ground for believing that a galvanic current, in the form of electrolysis, may, some time in the future, prove the best means of attack upon a tuberculous process in the lungs. Some recent experiments of Apostoli show that the influence of the positive pole of the galvanic current is a powerful germicide in its action, even such vigorous microbes as the bacillus anthrasis being destroyed by a very short exposure. No experiments have as yet been made with the bacillus tuberculosis, but I have work of this sort in progress in my laboratory, the results of which I hope to be able to report upon at an early date.

A building for a sanitarium in Colorado, one of whose great attractions is its sunshine, should be provided with glass-inlosed corridors or verandas, to afford opportunities for exercise in the sunshine without exposure to a low temperature during a cold spell.

Nearly all classes of patients suffering from pulmonary disease may be benefited by the proper employment of passive, or active-passive, muscular exercise. There is no class of patients in which massage, skilfully administered, secures more satisfactory results. A well equipped sanitarium anywhere must include a department in which masso-therapy and manual as well as mechanical Swedish movements may be employed in a most skilful and thorough manner. I have found particularly useful in this class of cases various exercises and manipulations, by which the respiratory movements may be increased. In some classes of patients the application of the movements employed in artificial respiration, as by Sylvester's method, prove very serviceable. I have had in use for a number of years an apparatus run by steam, in which a patient sits while being put automatically through the movements of respiration. Masso-therapy and passive movements are also of great use to a patient suffering from pulmonary ailments, through its beneficial influence upon various other morbid conditions which are either coincident with or dependent upon the lung

infection. For example, Dr. Bouchard, in his "Leçons sur les Auto-Intoxications dans les Maladies," asserts that in two thirds of all the cases of phthisis, dilatation of the stomach is found as a co-existent condition. In my own observations I have found this condition present, and often accompanied by a condition termed by Glenard enteroptosis, in fully fifty per cent of the chronic cases. These cases are practicably incurable by any other means than masso-therapy, and without the aid of this valuable therapeutic means, it is extremely difficult and usually impossible to afford the patient relief from the great disturbance of nutrition occasioned by this condition of the stomach. The improvement of digestion in a phthisical patient will accomplish more in combating his disease than any other one thing, and certainly massage, especially directed to the stomach and bowels, will accomplish more in this direction than any remedy that can be administered internally.

Active exercises are not of less importance than passive exercises, and for this purpose a gymnasium is an indispensable feature of a sanitarium. A gymnasium does not consist simply of a large room with a few ropes and rings, dumb-bells, Indian clubs, horizontal bars, and jumping-boards. A gymnasium to be used by invalids need not be provided with apparatus for heavy gymnastic work. Indeed, I find it more prudent to exclude such appliances from the gymnasium almost altogether. Instead, it should be equipped with suitable apparatus for developing the muscular system in general, and the muscles of the respiratory apparatus in particular, by gentle and carefully graduated exercises. The gymnasium should be under the care of a director who is capable of carrying out to the letter the prescriptions made for each patient. To prescribe exercise intelligently, a physician must necessarily know something of the principles of physical culture, and must have some knowledge respecting the value and potency of each of the appliances for exercise at his command, as well as of the physiological action and proper dosage of the drugs which he administers. Exercise is a powerful therapeutic agent when properly employed, but it is probable that phthisical patients do themselves as much harm as good through its injudicious employment. The method which I have found most useful in employing exercise for invalids is as follows : Each patient is

submitted to a careful physical examination, which includes not only the usual examination of the heart and lungs, but examination to determine the condition and position of the abdominal viscera. Measurements of the chest and waist are taken, as well as comparative measurements of symmetry. The lung capacity and strength of expiratory and inspiratory movements are noted by means of the spirometer and the pneumatometer. The strength of each group of muscles in the body is then tested by a universal dynamometer which I have devised for this purpose, a description of which I will publish elsewhere. A careful prescription is then made for the patient, and he is set to work taking each day his daily dose of exercise, modified somewhat according to his changing physical states, as regularly and systematically as he does his daily meals. Certain kinds of exercises, as calisthenics, Indian clubs, wand exercises, breathing exercises, and the graceful Delsarte exercises, are taken in classes, accompanied with music. The benefits to be derived by exercise as a therapeutic agent, when thus restricted and symmetrically employed, need only to be seen to be appreciated. Once a month, or at more frequent intervals, the patient is tested by the dynamometer, and the results recorded. I have frequently seen patients nearly double their strength with three or four weeks' training of this sort, and in some instances the strength is more than doubled. The respiratory muscles of most phthisical patients are, when first examined, found to be greatly weakened. In some instances I have observed almost complete immobility of the chest, the patient depending upon the feeble diaphragmatic action to maintain respiration. By the combined use of massage, electricity, manual or mechanical aids to respiration, and carefully graduated exercises, the vigor of respiratory movements may be doubled within a very short time. Riding and walking classes may be usefully organized in connection with gymnastic work.

Special appliances for the treatment of pulmonary diseases must include the most approved means of employing medicaments by inhalation, as well as measures for the treatment of affections of the nose and pharynx. Apparatus for the employment of air under varying pressures is essential, together with apparatus for the preparation and use of oxygen and

other gases. These appliances are certainly not panaceas, but they are clearly most important and valuable accessories, and not only afford great relief to the patient, but delay the progress of disease, if they are not capable of arresting it altogether. The weak point in appliances of this sort is that their application cannot be made constant enough to produce a sufficiently powerful impression upon the affected tissues.

From the experiments I have made during the last ten years, I believe much can be accomplished by the employment of what might be termed "medicated atmospheres." I have seen great good result from placing the patient in a room furnished with appliances by which the entire air supplied to the room is impregnated with the medicament considered best adapted to the case. I have used creosote, chloride of ammonium, and various balsams in this manner, with more than ordinary results.

I believe also that much may be accomplished in pulmonary cases by the regulation of atmospheric conditions on a small scale. It is quite impossible to find a climate which is absolutely perfect, and which is the best adapted to pulmonary ailments at all seasons and at all times. Even the unsurpassed climate of Colorado must allow some imperfections. To meet this universal disadvantage, a sanitarium should be provided with certain apartments in which the atmospheric conditions can be controlled to a modified extent, and thus an artificial climate created. By this means the most important atmospheric conditions—warmth, heat, and moisture—can be very perfectly controlled. Air which is too dry can be moistened with the addition of steam, and air that is too moist can be dried by suitable means. It is even possible to appreciably increase or diminish the atmospheric pressure of an apartment at a very small cost, by means of exhaust or pressure fans. This I have never undertaken, but have found it entirely feasible to regulate to a nicety the temperature and hydroscopic conditions of the air, and apparently greatly to the advantage of such classes of patients.

Believing as I do in the contagiousness of tuberculosis, I consider of the greatest importance the employment of most thorough-going measures to prevent infection. It is my cus-

tom to require every patient suffering from this disease to collect all the sputa in paper receptacles, which are burned, so as to insure absolute disinfection of all microbes. I believe it possible for much mischief to be done by bringing together a considerable number of tuberculous patients without taking precautions of this sort. In localities in which complete immunity from this disease was once enjoyed, tuberculosis has become indigenous through importation of the bacilli by tuberculous patients. It is not to be supposed that the constantly changing air of such localities has become infected, or that either the soil or the water is the habitat of the mischievous bacillus. The hiding-places of the microbes are to be found in the hotels and boarding-houses, in carpets filled with the dust of dried sputum, and in upholstered furniture in which such dust has lodged. In a thousand ways places in which no restrictions are placed upon tuberculous patients, and no pains taken to destroy the microbes by disinfection, may become the source of danger to the well.

The dietetic department of a sanitarium is by no means of small importance. One of the greatest inconveniences experienced by invalids availing themselves of climatic changes, is the difficulty in securing suitable food properly prepared. The average hotel or boarding-house cook knows nothing of dietetics or of the chemistry of cooking. A sanitarium must provide food prepared in such a manner as to be both wholesome and palatable, tempting to the patient whose appetite is perverted and fickle, and at the same time easy of digestion and highly nourishing. The only cook who can accomplish this is one who has been specially trained for the purpose. Bad eating, and the consequent impaired digestion, undoubtedly lays the foundation for many cases of pulmonary disease, and hence a careful regulation of the dietary, with the provision of suitable food for the invalid, is one of the things which certainly should be found in a well-regulated sanitarium.

In meeting the demands of invalids, it is often necessary that special food preparations should be provided. The reality of the demand of this sort is shown in the sale at the present time of peptones, peptonoids, and prepared foods of every description, which has grown to be an immense and doubtless, to the manufacturers, a very profitable business. The profit

to the consumer is by no means commensurate. Peptones and peptonoids, and the various preparations from beef blood and butchers' remnants, really possess, as has been shown by Bouchard, Dujardin-Beaumetz, and others, very small nutritive value, while they contain a very considerable amount of undesirable material, in the shape of leucomaines and not infrequently ptomaines, some of which, in any but the smallest doses, are highly poisonous. Notwithstanding their small value, most of these food preparations are sold at a price which would furnish an individual enough nourishment for an ordinary meal, only at the cost of several dollars. The foods which are best adapted to the individual and which are of greatest utility and the highest nutritive value, can be manufactured at small expense, and it is almost indispensable that a large establishment for invalids should be provided with the facilities for the manufacture of such special food preparations as may be needed. Every patient has his diet prescription, and must be required to follow it implicitly. In cases requiring it *lavage* and *gavage* should be skilfully employed. There are no therapeutic means which are followed by more brilliant results in suitable cases than these.

A complete medical establishment, such as a sanitarium should be, should be furnished with every possible means for diagnosis. In addition to the ordinary appliances for physical examination, the cardiograph, the pneumograph, the pneograph, the sphygmograph, the chronometer, electrometers, and other means for electrical measurements, facilities for bacteriological work, and whatever else will aid in the study of disease, must be in readiness for use. I hardly see how a sanitarium can be successfully conducted without a laboratory well equipped for carrying on chemical, physiological, and biological work. Within a month of the present moment I have been forcibly impressed with the value of bacteriological examinations. It is my custom to examine the sputa for the bacillus tuberculosis in every case of suspected phthisis. A few weeks ago a patient from the Pacific coast came to me for treatment for chronic nasal and pharyngeal catarrh. A slight cough led me to make a physical examination of the lungs. I was able to discover nothing abnormal, although I made a careful exploration of all portions of the lungs, particularly of the apices. A

subsequent examination of the sputum showed bacilli tuberculosis present in considerable numbers. After repeated subsequent examinations, I was able to determine slight physical signs of mischief in the apex of the right lung. Since that time the symptoms have become more marked, and at the present time there is unmistakable evidence of a tuberculous deposit in the right lung. I am quite certain that without a bacteriological examination I should not have made a correct diagnosis of the case. I advised my patient to become a resident of Colorado, with the expectation of remaining there, and I trust the superior climatic conditions which he will find here will restore him to health.

A sanitarium affords the best possible advantages for physiological and pathological research. The facilities which are provided for therapeutic use can be largely made valuable for carrying on experimental researches of a varied character. By the aid of the methods of the physiological laboratory morbid conditions can be most accurately studied, the progress of disease can be observed with precision, and the influence of remedies can be noted with facility.

Meteorology, in relation to health and disease, one of the newest lines of medical research, ought to receive a liberal share of attention in connection with this line of work, and hence a sanitarium should afford proper facilities for it. Fifteen years of experience in meteorological observations, as well as the study of the results of the extensive researches carried on by the State Board of Health of Michigan, have convinced me of the great importance of this line of study, and the valuable results which in time will be yielded by exact and persevering work in this line.

Every sanitarium should be provided with a well-equipped and aseptic surgical ward, for the proper care of cases requiring surgical treatment.

Facilities for recreation must also be provided, although I must speak against the introduction of exciting amusements. The individual who is in earnest about getting well will go about the matter in a business-like way, and if all that is possible is done for him, and every possible facility afforded him, he will have enough to keep him busy the greater part of his waking hours. I am quite opposed to the encouragement

of games of chance, other than such simple games as croquet, lawn-tennis, etc., which afford exercise as well as diversion. Card-playing, chess, and billiards, I think, ought not to be encouraged. My objection is based upon the ground that the patient can spend his time more profitably, as regards health, in some other manner. In a sanitarium with nearly four hundred inmates, of which I have charge, games of this sort are not prohibited, yet patients very rarely engage in them. My plan is to keep every patient so busily engaged in profitable health-gaining employment that he has no time for anything which will do him the least harm.

Provision for the poorer class must not be forgotten in the organization of a large sanitarium. Said the Great Teacher to His disciples, "The poor ye have always with you." Every person who has ever had extensive experience in sanitarium work is prepared to appreciate the full force of this statement. The managers of a sanitarium hear constantly upon their doors the knockings of the worthy indigent invalid beggar admittance. A sanitarium organized upon the broad plan which I have outlined, and undertaking to do for the invalid all that modern medical science can do, should be organized upon so firm a financial basis, and administered in so liberal a spirit, as to make generous provision for the worthy poor; and while the latter may not be provided with the same luxuries as are the wealthier class, they may be furnished, at very moderate cost, or to a limited extent gratuitously, with the most skilful medical advice and treatment. An economical plan for the accommodation of this class would be the caring for of an agricultural and dairy ranch in connection with the institution, located at a distance not too great to be accessible by an hour's ride, and affording constant communication by telephone. At such a place patients could be given free grounds for pitching tents, which could be furnished at small rental, and in many instances could be furnished employment sufficient to pay the actual cost of table board. In this way expenses could be reduced to a minimum, and thus the poor could receive benefits of which they would be deprived if compelled to pay the same price as the rich. Of course in such a scheme it would be necessary to provide the in-door accommodations for the poor during inclement weather, or it might not be possible to

carry on this branch of the institution excepting during the warmer months of the year.

Finally, one thing more is eminently necessary for the successful establishment of a sanitarium in Colorado—viz., a well-trained and organized corps of physicians, nurses, attendants, cooks, and other employés. Indeed, this is the most essential part of an institution of this sort. The lack of trained and experienced workers has doubtless been the chief cause of failure in a large proportion of the hundreds of sanitarium enterprises which have been started in various parts of the country, and which after a few months of painful experience ignominiously collapsed. A constant educational work must be carried on to supply substitutes for those who drop out of the institution, and to provide for the growth of the institution.

I think it safe to predict that there is a great future before institutions organized on the sanitarium plan, which will work in scientific and professional lines, so as to command the respect of the profession, and which will keep abreast of the advanced line of progress in the development of rational medicine. Thousands of cases which after years of drifting about among physicians are given up as incurable may be restored to health by a few months of "health training" in a well-conducted sanitarium. The necessity for the treatment of certain classes of individuals in properly managed institutions is coming to be generally recognized, and the need of institutions of this sort is each year appreciated more by those who pursue the practice of medicine, with a constant purpose to secure for their patients the best possible results in the shortest possible time.

DISCUSSION.

AFTER the reading of Dr. Kellogg's paper, Dr. Rogers announced the particulars of an excursion into the mountains, by the members of the Society and their friends, which was discussed at some length.

The following discussion took place on Dr. Kellogg's paper :

Dr. Bowditch: I should only like to add my appreciation of Dr. Kellogg's admirable paper. There is one thing that occurs to me in regard to the establishment of a sanitarium for consumptives ; in fact, the objection has occasionally been brought up that it is not a good plan to put so many consumptives together on account of the possible contagion and depressing effect.

As far as the latter is concerned, I think it would amount to practically nothing, or very little. I questioned a lady last summer, who had been at a sanitarium in Germany two years, and she said, "The first two weeks I had a slight depression, but after that I thought of nothing except this delightful place, and I should be sorry to leave it." She was gradually improving, with a prospect of recovery.

When at Dr. Trudeau's Sanitarium in the Adirondacks, I asked him about the advisability of putting so many invalids together. He asked me to listen. I looked at the other end of the piazza, and a lot of patients were singing and laughing together, and he remarked that that was their condition the whole time, so the objection amounts to practically nothing.

Dr. Kellogg spoke also of establishments for the poorer classes. I have spoken of this at previous meetings, and I regard it as of the greatest importance. There are also classes who cannot go to Colorado, which is, so far as we know now, *the climate of America* for certain cases ; and I should like to say again that I think a great deal more can be done, as our good friend, Dr. Kretzschmar, of Brooklyn, has said so urgently, in the immediate vicinity of our own cities, where the climate is not so salubrious.

I am connected with the building of a sanitarium at Sharon, Mass., near Boston, that is now well on its road to completion, which is intended solely for people of a class who cannot afford to go far away from home, but where, I am convinced from experience, we can do very much more than we have been able to do in Boston. I hope, in the course of our meetings in the future, to be able to tell you something of the results accomplished there, although we do not hope to accomplish what we could in a similar climate to this. I feel, as I said before, that a great deal more can be done by properly established sanitaria near our great cities.

Dr. Solly: I was very much interested in Dr. Kellogg's paper, and I fully agree with what he says. There is no man more competent to speak of these things, because he has carried them out practically. I have not had the pleasure yet of paying a visit to his sanitarium, but I know of many who have, and they all endorse its high character. If the doctor builds a sanitarium in Colorado, I hope it will be in Colorado Springs.

Every case is not suited for a sanitarium; some undoubtedly do better at home. The greater number of consumptives, however, would, I believe, improve more surely and rapidly in a sanitarium. The results of the cases I have just reported to you would, I think, have been yet more favorable if a majority of the patients had been treated in such an institution as Dr. Kellogg has described. That these matters are carried to too great an extent, and too much fuss made over little details, is doubtless often true.

As the doctor says, the name of sanitarium has been misused, and is often applied to a place where a number of invalids are simply herded together, without any proper curative measures being applied to them. In fact, the real word we ought to use is "hospital"—a hospital in its proper sense. There is no patient that dislikes to go into a hospital more than a consumptive; and they object to being labelled as consumptives; they say their lungs are not affected, they have only bronchitis, etc.; and this is so, because consumption is still looked upon as a necessarily fatal disease by the laity. I myself was labelled a consumptive twenty-six years ago, but I am still here, and hope to continue for some time.

Dr. Kellogg: I would be very glad to know how the profes-

sion in Colorado feel with regard to the establishment of a sanitarium here, as I see quite a number of the gentlemen of the profession here. I have come to the State—this is the second time—to look about a little with reference to the establishment of a branch institution. We are sending away from our institution every fall to Colorado and adjoining States enough people to fill a moderate sized sanitarium, because of their climatic advantages, although we endeavor to do as much as possible for them by means of artificial climates. We still have quite a contingent of consumptive patients that we keep at home and care for that cannot be induced to go so far away on account of the lack of suitable advantages for the care of invalids in these dry Western States. I think, as Dr. Bowditch does, that a good deal can be done for these patients in their home climate, but of course sanitarium and climatic advantages combined will do more for them than either can do alone.

I have felt somewhat doubtful about the propriety of establishing a sanitarium in a climate specially advantageous for consumptives. I have thought, in the first place, it might not be a financial success. The local physicians might consider it not in the interest of the profession. Perhaps the patient would consider that the advantages are all out-doors and free for everybody, and so consider it not necessary to attach himself to an institution ; and so a good many things are to be thought of.

The institution we propose to establish in this State, if we start one, will be largely a philanthropic one. The dividends will be assigned by the stockholders for the purpose of improving the facilities, and in the support of a charity department, as we have been doing for the last twenty years at an institution at Battle Creek. We spend fifteen or twenty thousand dollars a year in the treatment of the sick poor, and our work in this line is increasing. If we establish an institution in this State, it will be on the same basis, and will be a non-dividend institution ; a stock company, but on the plan of a self-supporting charitable institution—the profits received from the wealthy to be used in caring for the worthy sick poor. In the first ten or twelve years, the profits must be largely used in increasing the facilities ; but some charity work will

be done from the first. Personally, should not care to be connected with any other kind of an institution. Our work at Battle Creek is on that basis, and if we have anything to do with an institution in this State, it will be on the same basis. The only compensation expected, so far as I am concerned, will be in the satisfaction of contributing to the advancement of rational medicine and the benefit derived by the patients. Unless we can organize an institution here in the interest of the profession, and in harmony with them, we don't care to come.

I am glad to have the opportunity of placing the matter before the profession of this State, so that the character of the proposed institution may be understood.

Dr. Denison : We are very much obliged to Dr. Kellogg for presenting his subject so plainly, and we trust, if he will decide to come here, his institution will be a great success.

Personally, I have expressed my opinion in my introductory remarks yesterday, and I take no exception to what has been said, unless it is, as it seems to me, that more importance should be given to building such a sanitarium in Colorado, on the cottage plan, rather than in one central institution.

THE THERMAL SPRINGS OF SALT LAKE CITY.

By DR. GEORGE W. FOSTER, of Salt Lake City.

THE subject of natural mineral waters has in former years engaged the attention of this Association, and efforts have been made to determine with more exactness the therapeutic value of these waters as they occur in the United States. In the line of this inquiry, by courtesy of your president, I am enabled to offer the following brief contribution in relation to the thermal springs in and near Salt Lake City.

In this instance, as in similar cases, difficulties are encountered at the outset in lack of suitable accommodations and appliances at the springs, and of competent medical supervision and clinical study. What I have to offer is derived from limited personal observation, the statements of other physicians in the city, and of patients who have used the waters ; supplemented by deductions from the known constituents of the springs, and the use of similar waters from other springs whose effects have been more accurately observed. Along the western base of the Wasatch Mountains, which surround Salt Lake City on the east and north, these springs break from the ground at intervals for an extent of several miles. Two only of these have been utilized by the erection of baths, and these of the most primitive sort, consisting simply of buildings enclosing apartments containing tubs and "plunges." The Warm Springs are within the city limits and are accessible by electric car-line. They have a temperature of 103° F. Beck's Hot Springs are about three miles from the centre of the city, accessible by two railroads, a bus-line, and prospective electric railway. Their temperature is about 130° F. Considerable quantities of free carbonic acid and sulphhydric acid are contained and given off from the water.

The flow from Beck's Hot Springs is about six hundred gallons per minute. Another spring (not utilized) a half mile to the south of Beck's and nearer the city yields a similar

flow, while the Warm Springs, owned by the city, flow about two hundred gallons per minute. The water from the various hot springs forms a lake estimated at about one hundred acres in extent, whose overflow is into the Jordan River, ultimately contributing to the saline constituents of Great Salt Lake. Analyses of these springs are as follows :

CONSTITUENTS.	Beck's Hot Springs.	Warm Springs.
	Grains per Gallon.	Grains per Gallon
Chloride of Sodium.....	.95506	.77248
Chloride of Magnesium.....	.4334	.01588
Carbonate of Magnesium.....	.....	.03412
Chloride of Calcium.....	.06957	.....
Sulphate of Calcium.....	.01907	.13668
Carbonate of Calcium.....	.03001	.03321
Chloride of Potassium.....	.03761	.03388
Silica.....	.00315	.00212
Organic matter.....	Trace.	.....
Iron.....	Trace.	.....
Total.....	1.25871	1.02845

Considerable quantities of hydrosulphuric acid and carbonic acid gases are contained and given off by the waters.

These analyses are doubtless merely proximate, as regards the particular constituents as they exist in the waters, and it is a question in chemistry, which I have not had an opportunity of verifying, whether or not in the presence of free sulphydric acid the bases would be found united with it, to some extent, in form of sulphides. Estimated by the law that each degree of temperature in excess of that of the soil represents a depth of source amounting to about fifty-five feet, the depth of source of the hot springs would be about five thousand feet.

Under this great pressure the gases are held in solution or possibly unstable union with bases and freely discharged in large bubbles as the surface is reached. Whether or not under changes of temperature and pressure such chemical changes occur as to give to any elements or compounds increased activity from the "nascent state," I will not attempt to discuss ; mere speculations would be of no practical value, as compared with clinical facts. The chief solid constituents of the springs are the chlorides of sodium, potassium, magnesium, and calcium, the carbonates of magnesium and cal-

cium, a small amount of silica, and calcium sulphate. The waters are very soft, soap not being required even in the washing of clothes ; whether due to the presence of gliadin or other element not mentioned in the analyses, I am not able to state. Taken internally the water is, as its composition indicates, mildly laxative, in doses of from two to six or eight glasses daily, which quantity is usually taken by those using the baths.

The springs are mostly used by those suffering from rheumatic and other chronic affections of the joints, scaly cutaneous eruptions, lead poisoning, boils, abscesses, scrofulous ulcers, and catarrhal affections. In rheumatism their value is attested by physicians and still more strongly by the laity ; and lack of accommodation only appears to stand in the way of their use by large numbers of the victims of this disease. In chronic eczema of the scaly form the scales are readily removed, and patients have expressed themselves as greatly benefited by their use. Data are meagre upon this point, however. Lead poisoning is relieved by the action of the hydrosulphuric acid upon the metal, as it is eliminated by the skin and mucous membrane of the alimentary canal, converting it into the insoluble sulphide and thus preventing its reabsorption. Other methods of treatment, as by potassium iodide and magnesium sulphate, may be more rapid and efficacious in some cases. That sufferers from mercurial poisoning, syphilitics, or other cachexias would be benefited by these waters combined with suitable tonic treatment seems to be probable, from the experiments of Dr. L. Blanc at Aix-les-Bains, upon patients under treatment by the sulphurous waters of those springs.

By the solvent power of hyposulphite and sulphite of sodium formed in the blood from sulphur, in presence of alkaline salts and oxygen, albuminate of mercury is dissolved and eliminated by the urine. In two fifths of the cases where mercury had not been taken for one, two, or three months, it was found in the urine after the thermal sulphur treatment, its absence having been demonstrated before the treatment was begun, indicating that it had accumulated in the body and was thus eliminated. The Salt Lake springs have been found to be particularly efficacious in the treatment of boils, ulcers,

and abscesses attended with unhealthy pus formation. This accords with the recommendation of Ringer in the first edition of his "Therapeutics" of the use of the sulphides in these affections, and the experience of many others since.

Gastric and intestinal catarrhs are also benefited by similar waters and inferentially by these. Without going to any extent into the question of absorption by the skin, it may be mentioned as an accepted fact that hydrosulphuric acid is absorbed by the lungs and alimentary canal, and is an agent of some potency for good or ill in the economy, demanding in its use the circumspection usually employed in the use of active drugs, and deserving special study. Perhaps enough has already been said to indicate to those interested in thermal mineral springs the comparative value of those at Salt Lake City.

It is probably true of these, as of all other thermal springs, that their value is not because of their mineral constituents solely or even chiefly, but by reason of the system of hydro-therapeutics established upon them, combining with the depurative action of their internal use the potent agencies of baths, douches, and massage with skilful gradation or alternation of temperature, and without which they are unscientific and unpractical. The climatic and hygienic surroundings, the recreations of the place, the regulation of diet and of habits, the unreserved yielding to treatment and pursuit of health, the faith and hope inspired by occult qualities supplied by the imagination, are also well-recognized factors of the various water cures. They are *cure-factors* which can probably be so well combined in no other way, and a well-organized sanitarium of this sort is a boon alike to patient and physician.

With the admirable climate and delightful surroundings of Salt Lake City, the unique attractions of the Lake, the growing wealth and importance of the city, and the undisputed advantages of ample volume and temperature, it cannot be doubted that suitable improvements will soon be made at these springs, greatly enhancing their advantages. As the water is in abundance and fully heated in nature's caldrons for all possible therapeutic uses, even if it were of double-distilled purity, beyond that of Poland or Bethesda, there are here afforded all desirable elements of an attractive and effective health resort.

THE RELATION OF THE MECHANICAL ARTS TO PREVENTIVE MEDICINE, PARTICULARLY IL- LUSTRATED BY THE ARTESIAN WELLS AND TIDAL DRAINS OF CHARLESTON, S. C.

READ AT THE EIGHTEENTH ANNUAL MEETING OF THE
AMERICAN PUBLIC HEALTH ASSOCIATION, AT CHARLES-
TON, S. C., DECEMBER 18TH, 1890.

By A. N. BELL, A.M., M.D.

THE mechanical arts, as a department of knowledge, depend upon the active formative processes of the mind which result in invention as distinguished from organized knowledge deduced from the contemplation of previously recognized truths, or phenomena, which constitutes science ; the work of art is *invention*, of science *discovery*.

During the processes of civilization the arts have always taken precedence of science. Among crude people in all ages and everywhere, in default of a store of information to draw upon, self-preservation depends upon manual labor and dexterity ; and the excellence of the products depends upon the cultivation of the senses, aptitude for improvement and perseverance.

It has been by the persistent use of these means and a prodigal use of material, that the grandest products of genius, since the world began, appear to have been accomplished before the birth of philosophy, representing beauty and strength in such exquisite proportions as to supply models which modern art, with all the aids of science, strives to imitate, but makes no effort to excel. It is scarcely necessary to remark that reference is here made to ancient sculpture and architecture. Lest exception be taken to this citation as being irrelevant, it is well to remember that modern research among the ruins of ancient cities reveal sanitary works also of marvellous skill.

As populations increased and became concentrated, water was conveyed in immense horizontal channels, supported

upon arcades of such prodigious elevation as to puzzle modern engineers in their contemplation of the means used for the construction of such works. Of sewers, the *Cloaca Maxima*, in Rome, constructed more than twenty centuries ago, still retains its strength and adaptation to the purpose for which it was originally intended. Alexandria, Jerusalem, Nineveh, Herculaneum, and Pompeii, and many other ancient cities whose sites are maintained by the magnitude and excellence of their ruins, reveal reservoirs, systems of aqueducts, sewerage, drains, and public baths ; also latrines and other domestic appliances which, for ingenuity, excellence in workmanship, and adaptation to their purpose, in some respects compare favorably with the best sanitary works of the present day.

Doubtless there were numerous inventions found to be of no practical utility, and quickly discarded. But we are not justified, on that account, in the belief that the fittest only survive. It may be that some of the most excellent devices were constructed of perishable material, and are consequently wholly lost.

That the Jews, in ancient times, when the priests were physicians, had a tolerably clear conception of practical sanitation the Mosaic record bears abundant evidence. There was among them a very intelligent, if not, indeed, scientific, recognition of diseases that were preventable, as distinguished from those which were not. And, omitting mere legendary with regard to medicine, as at first practised, no attentive reader of Hippocrates' works, particularly his treatise on Airs, Waters and Places, will fail to observe that preventive measures were based upon the contemplation of physical phenomena. Indeed, the recognition of conditions inimical to health, and the use of mechanical appliances in conjunction with regulations for the promotion of health, even when no such conditions were manifest, as illustrated by the Levitical code, the first fundamental treatise on medicine (Hippocrates), the high estimation of, and provision for the practice of physical culture by the most enlightened nations of antiquity, show that the prevention of disease was not only the leading sentiment of those who exercised the function of physicians among the ancients, but that it also, then, as now, com-

manded the attention of the most highly cultivated people, and the highest degree of excellence in the application of the mechanical arts for its cultivation and promotion.

The ancient Romans, as well as the Jews under the Mosaic dispensation, were a scrupulously cleanly and healthy people both with regard to their dwellings and their persons. And for a few centuries subsequent to the Christian era, the Christians were in like manner cleanly in their habits. But in the progress of the ages, when the teachers of Christianity, who were the most highly educated of the people and the leaders of public sentiment, ceased to observe the sanitary laws of the Jews and Romans, because they deemed them to be, in common with all other Jewish and Pagan laws, sinful, and went to the opposite extreme, insomuch as to consider filthiness an evidence of sanctity, it is surely no wonder that the period of the Middle Ages, of which this was the beginning, was characterized by the most appalling epidemics.

That under the sway of such influences practical sanitation ceased to be a virtue is no more surprising than that all other mundane affairs fell into neglect, stagnated, or retrograded. There was no effort to stay the progress of disease, or to recognize its preventable causes, and ere long the people became so demoralized by the prevalence of epidemics, and so appalled by the doctrine of the false teachers that their diseases were the visitation of God on account of their sins, that they were for the time well-nigh bereft of their senses. But no one at this day, who has made himself at all familiar with the history of the great epidemics of the Middle Ages, and the habits of the people, doubts that they were due to filthy surroundings.

But, passing from mediæval to modern times, if it were our purpose to trace the progress of practical sanitation, it would be an easy matter to mark the steps by which it has gained its present attitude and earned for itself a new and more comprehensive name. Happily for the well-being of mankind in this age of experimental knowledge, medical science, as a whole, has kept pace with the triumphs of inventive genius, and in none of the branches into which this comprehensive science is divided has this co-ordination been so marked as that which justifies the use of the term Preventive Medicine.

Preventive Medicine began as practical sanitation by the application of the mechanical arts exclusively. But so anciently that that which the unlearned of its votaries are wont to call the "new science," is, at the least, as old as the Mosaic record. And it exists to-day not only as the most ancient code of organic knowledge for the protection of human life, but because in its progress through the ages, and particularly during the present century, it has excelled all other branches of knowledge in its triumphs over the enemies of mankind.

With its incorporated resources during the progress of civilization and particularly in modern times, since diseases for the most part have been recognized as the result of disobedience to sanitary law, Preventive Medicine, as *now* understood, comprises the knowledge of preventable diseases and their causes, of the means of their prevention, and how to apply those means.

It is based upon the laws of physiology, general pathology and chemistry. It is, therefore, at the outset one of the subdivisions of scientific medicine, but by far the most comprehensive one. For its successful practice, it demands, in addition to the knowledge required by the medical practitioner, a much more extensive acquaintance with other branches of knowledge—of the laws of physics, climate, geology, botany, biology, bacteriology and a general knowledge of the mechanical arts.

The mechanical arts stand in the same relation to preventive medicine, as at present understood, as pharmacy to curative medicine; and without a general knowledge of them, and an aptitude for their application, a pretended knowledge of preventive medicine is of less practical utility than a good knowledge of the mechanical arts is without medical knowledge.

For illustration, no place, to our knowledge, affords better examples than the city of Charleston. Situated on a peninsula between two rivers, overlaid with a bed of quartzose sand with great absorptive power, there was no apprehension in the minds of its first settlers that, with the abundant rainfall, averaging nearly forty-four inches yearly, there would ever be any lack of wholesome water, or any danger of a water-logged soil. But we gather from the annals of the city* that, on the

* "Year Book," City of Charleston, 1881.

increase of the population, ere half a century had elapsed, the water in the wells, especially in the more populous portions of the city, had lost its purity and was becoming worse and worse —hard, disagreeable to the taste and unwholesome. The evil went on increasing. Meanwhile, it was discovered that the bed of sand, which was at the first deemed to be a healthful foundation, was, at a depth of about twenty feet, superimposed upon a bed of impervious clay, and, in the populous districts, saturated with the soakage of surface filth ; and this bed of filth was the measure of the depth of the wells. Without, apparently, considering the danger of such a soil to health, independent of the water-supply, a worthy citizen, one Mr. Long-street, of a mechanical turn of mind, determined to sink a well on his own premises deeper than any which had hitherto been sunk, in search of better water. Pursuing the ordinary process of well-digging, on reaching the bottom of the twenty feet depth of foul sand, he encountered the stratum of impervious clay. In attempting to penetrate it, he found so much difficulty in keeping back the inflow of water from the sand around, he was obliged to change his plan, by sinking an iron tube, beginning at the bottom of the well already at the depth of twenty feet, from the surface. When he had penetrated the clay to the additional depth of thirty-seven feet, making the entire depth fifty-seven feet from the surface, water rose up freely through the tube, filling the well above to within six feet of the surface. The water thus procured was described as being “similar to, but purer than the ordinary well water.” This was the first step taken in the progress of artesian well-boring in Charleston. It was pursued by mechanics solely, with several changes of contractors and numerous breaks and inventions of new tools, during a period of about seventy years, encountering and overcoming obstacles from time to time greater than any elsewhere known to the art of well-boring, with the following result, from official sources :

CHARLESTON, S. C., Dec. 4, 1890.

Dr. H. B. Horlbeck :

DEAR SIR : I am in receipt of yours of 3d inst., enclosing letter from Dr. A. N. Bell. I see by his letter that he has the full particulars of the Marion Square well, as published in the “City Year Book” for 1881, and that he wishes information

in regard to the two wells bored since. Perhaps, however, it would be as well to begin by giving depth, size and flow of each well, as follows :

No. 1. Marion Square : Depth, 1970 feet ; size at bottom, $2\frac{11}{16}$ inches ; present daily flow, 200,000 gallons.

No. 2. George Street : Depth, 1950 feet ; size at bottom, $3\frac{1}{4}$ inches ; present daily flow, 300,000 gallons.

No. 3. Hanover Street : Depth, 1945 feet ; size at bottom, $5\frac{1}{2}$ inches ; present daily flow, 1,200,000 gallons.

I enclose herewith chart of the strata of well No. 1, and the same strata were found in the other two, with the slight difference of a few inches or feet for dip or inclination.

Well No. 2 was begun in April, 1881, and finished in October, 1884. Well No. 3 was begun in March, 1885, and abandoned by the contractor after six months' work. In May, 1886, work was resumed by another contractor, and the well was finished in September, 1889. Many difficulties were encountered in the boring of these two wells, chiefly owing to the upward rush of sand into the pipes whenever any of the numerous water-bearing sands were encountered. It will be observed that more than three years were consumed in the boring of each of the three wells.

The aspect of the strata downward, as represented by the chart of well No. 1 just above referred to, from specimens and records of the borings, is as follows :

First, drift for a depth of seventeen feet, made up of yellow sand, sandy clay, and white sand ; second, post-pleiocene, with thirty-two feet of blue clay and eleven feet of blue clay sands, followed by three hundred and thirty feet of lower tertiary formation, composed of white sands, sandy marl, one hundred and eighteen feet of argillaceous marl with nodules, ninety-one feet of argillaceous marl, and ninety-seven feet of calcareous marl. Third, at the depth of three hundred and ninety feet cretaceous formation appears, first with alternating layers of arenaceous limestone and calcareous marl in layers of varied depths till, at the depth of four hundred and seventy-seven feet, there is a layer of white limestone one foot in depth succeeded by arenocalcareous marl, and alumino-magnesium marl. From five hundred and forty feet to seven hundred and ninety-four feet depth is a mass of marl, below which is mica-

ceous marl with iron pyrites for a depth of forty-two feet ; next follows marl with sandstone layers for a depth of one hundred and twenty-four feet. At nine hundred and sixty feet depth sand with considerable water appears followed by a shallow bed of hard sandstone, which is again succeeded by a mass of marl, sand, and clay imposed upon a layer of very hard sandstone ; and again, at the depth of twelve hundred and thirty feet, is a mass of sandstone eighty feet thick, followed by thirty-five feet of dark sand and clay, five feet of shell breccia, forty feet of blue clay with hard layers, fifteen feet of green sand, one hundred and twenty-eight feet of marl, shells, and iron pyrites. At fifteen hundred and thirty-three feet depth a stratum of hard sandstone twenty-four feet thick, underlaid with water-bearing sand ; then argillaceous sand and sandstone, till at the depth of sixteen hundred and ten feet, when a mass of blue clay and sand again occurs of two hundred and ten feet thickness. Next comes twenty-five feet of sand with water, five feet of sand rock, ten feet of loose white sand, and a layer of hard sandstone, below which is loose sand with water, blue clay and sand to the thickness of twenty feet. At nineteen hundred feet in depth a bed of sand ten feet thick, without water, and beneath this to the extreme depth of nineteen hundred and seventy feet argillaceous sandstone and alternate beds of sand and sandstone.

The analysis of the water from Well No. 1 is given in the "Year Book" for 1881, page 278, and as the other wells draw their supply from the same source, it may be taken as a fair analysis of them all, except that Well No. 3, being so much larger, and discharging more than twice as much as the other two combined, contains a less proportion of chloride of sodium and carbonate of soda.

The water is perfectly clear, and is very soft, and is regarded as the most delightful water in the world for bathing. Indeed, Dr. F. L. Parker thinks that when properly heated to the right temperature, it is as beneficial in cases of rheumatism as the famous Hot Springs of Arkansas. It is used for all domestic and manufacturing purposes, though, from the quantity of soda it contains, it turns anything which contains starch or gluten a yellow color when heat is applied. Hence it is not generally used for cooking, and in the laundry, where

white goods are to be starched, the last rinsing before applying the starch must be of cistern or pump water, so as to remove the soda before ironing. Many families in the city drink no other water, and regard its habitual use as a sovereign preventive of dyspepsia.

Perhaps it would interest Dr. Bell to know that wells Nos. 1 and 2 fell off in their daily flow at least 100,000 gallons, as soon as the lower vein of water was reached by the pipe of Well No. 3, the diameter of which was so much larger.

If there are any other points upon which Dr. Bell wishes to be informed, I will be glad to furnish them if in my power.

Yours very truly,

ZIMMERMAN DAVIS,

Secretary-Treasurer Charleston Water Works Co.

An analysis published in the "Year Book" before cited, made in August, 1879, by S. T. Robinson, Jr., Assistant in the Laboratory for Analytical Chemistry and Professor Charles U. Shepard, Jr., of one United States standard gallon, of 231 cubic inches in volume and weighing 58,438 grains, gives the following results :

Residue, on evaporation, in grains.....	65.0533689
Organic Matter and Water of Crystallization.....	1.733689
Carbonate of Iron.....	.335028
Sulphate of Lime.....	.442367
Sulphate of Magnesia.....	.165247
Chloride of Magnesium.....	.230291
Chloride of Sodium.....	11.390304
Carbonate of Soda.....	47.258488
Nitrate of Soda.....	.554260
Silicate of Soda.....	2.524745
Silica.....	.361700
<hr/>	
Total.....	64.996119

The water has a temperature of 99.5 F.

A second example, of interest to every sanitarian, is—bearing in mind the peculiarities of situation—the soil drainage of this locality—the *Tidal Drains*.

It was my privilege for many years to enjoy the acquaintance of the accomplished physician with whom this unique

system of soil drainage originated nearly forty years ago, the late Dr. William T. Wragg.

On a visit to this city, while in the service of the National Board of Health, in 1879, I obtained the description of the drainage of Charleston from Dr. Wragg, the originator of the tidal drains, and Mr. Louis J. Barbot, City Engineer, as printed in the Report of the National Board of Health for that year; from which the following is an abstract:

"The topography of Charleston is so flat," Dr. Wragg writes, "that in any system of drainage all idea of constructing sewers on declivity was out of the question. To obtain a force competent for moving water in them, therefore, it was necessary to use the water itself for that purpose. Fortunately, we had for this end the rise and fall of the tides. The tides would enable us, with properly constructed sewers, to give the water sufficient movement for the washing out of the solid sewage matter if scientifically managed. It will not be possible to go over the work in detail—I can only give you results.

"The bottoms of the drains were built on a dead level. The level was 30 (or 20) inches above mean low water. The top of the arch a foot above ordinary high water, but just above the level of spring tide, so that at each recurrence of spring tide the entire capacity of the sewer being occupied by pure sea-water, all gases would be thoroughly expelled. The drains were furnished with water-tight doors at each end. So far, in our plan, we had the means of carrying out our views, but in the construction of the work we were compelled for want of funds to do what we would willingly have avoided, viz., use wooden instead of brick bottoms, and to give them a flat instead of an egg shape. The soil of Charleston is such that at the depth of the drains' bottoms there is a stratum of quicksand. This, while it would have made it difficult and expensive to lay down brick, was an advantage for the wood, since this material, so long as it is submerged, does not decay. Hence we had no fears of our work being jeopardized in the future by that cause. And here let me say that I have no faith in the city officials who are covering up the neglect of the sewers by attempting to screen themselves behind the charge that they are falling into decay. The sewers con-

structed as above detailed had their openings or mouths at two very distant points. One set of mouths was at the upper suburbs, the other at the extreme lowest end of the city. At both ends they opened into the rivers that flow around Charleston on three sides.

" And now as to the manner of managing these drains, so as to secure the results promised for them. This was provided for in an ordinance framed by the committee who had conducted the work. A drain-keeper had been selected, and his instructions were to this effect, viz.: Taking up the description at the point at which the tide is low and the drains empty, the gates should be closed and kept so till the next high tide. At the moment of the highest tide at the upper end the gates should be lifted, and the outer water allowed to rush in till the drains were filled, which would be accomplished in about two or two and one half hours. At this time the upper gates were to be again closed and the water kept in until the next low tide. Now, the lower gates should be raised and the rush allowed to go on until the drains were empty. By this process it will be seen that the wash would be always going on in one direction, so that all solid matter would move in the same way and tend to pass out at the lower mouths.

" It was not contemplated to depend alone upon the flushing for clearing out the solid matter, for, seeing the great length of the longitudinal drains, this process would require too much time; so it was made the duty of the keeper to traverse the entire length of the drains once in every twenty-four hours, and removing the covers from the manholes (an arrangement in the constructions), to sound them carefully, and if any mud or other matter should be found there to remove it at once. It was also his duty, if heavy rain should come on while the drains were full of water, to open the lower gates so as to ease off the pressure that would arise from the great inflow. He was also instructed to retain the night tide in the drains for the use of the engines in case of fire.

" The old drains of the city had been constructed entirely without any plan. They were on different levels, and many of them were cul-de-sacs having no outlets. It was contemplated, from time to time, to bring these into harmony with the tidal drains. But with the change of the city officers the

new broom made a clean sweep. The first thing the new mayor did was to dismiss the drain-keeper and put the care of the drains in the hands of the police, who knew nothing and cared less about the duty. In the course of a few years mud and sand had been allowed to accumulate to such an extent that the drains were full, in some places up to the crown of the arch, necessitating a heavy outlay to remove it. The clearing out by this process (sending men down and drawing up through the manholes) has never been properly done ; the accumulation has never been properly removed. Masses have been left in parts of the drains not easily reached, and hence the charge made by the city engineer, viz., that the bottom levels have been destroyed by the decaying of the floor and the consequent crumbling of the cheek-walls and the arches. The flow of water being impeded by local accumulations of solid matter at intervals along the floor, he accounts for by alleging that the work was decayed.

" I mentioned above that the site of Charleston is underlaid by quicksand. This stratum supplies an inexhaustible supply of water. It is well known that the wood will not decay in water, hence the allegation that the plank bottoms have rotted is evidently inaccurate. The fault is in the management, and while I freely admit that the drains are not doing what it is claimed for them that they would do, I as fully claim that the failure is not in the plan or workmanship, but in the management.

" Much discussion went on while the work was in progress, and men of high pretensions to scientific attainment denied that any current would flow from the mouths when the gates were opened. To convince them an exhibition was given to which all doubters were invited, and to their utter amazement, when the gate was opened, they saw half bricks and paving stones roll out before the impetuous torrent.

" There is one more point to which I wish to allude before concluding. I mentioned above that want of funds had forced us to modify our plans in order to bring it within the means at our disposal. One of these modifications was this : In order to always have at disposal an abundant head of water, it was recommended to form a large reservoir in the marsh above the city, and connect it with the system of drains, so

that it might effect the flushing more perfectly than could be done by the water contained in the drains alone. The marsh at Creighton's bridge, up Meeting Street, was selected for the purpose.

"This sketch, hastily written, and altogether from memory, is quite inadequate to give an idea of the intention and execution of the work. But such as it is, it is much more than I ever expected to make."

WILLIAM T. WRAGG.

CHARLESTON, S. C., August 23, 1879.

Mr. Barbot writes, August 11th and 23d, 1879 :

"Very little was understood at that time in this country of sanitary works" (when the first soil drains were laid in Charleston), "and of the many reasons that might be given why cities of slight elevation above the tide-level should make a distinction between works of drainage and sewerage. These works, therefore, were designed and built to answer both purposes, and from what we have of the old system of drains and sewers, which bred the worst types of fevers by the escape of the sewer-gas through untrapped laterals into the atmosphere and through their pervious walls into the soil.

"The only date I can find of their construction is given in an old record made by the commissioners of streets and lamps, covering a period from the year 1806 to the year 1818, when a large number of these works were constructed. From 1818 to 1856 other works of the same character were built.

"The evil consequences of such works as described led to the adoption of the plan of tidal drains, so-called, but were not fully carried out. These tidal drains supply the places of the old sewers that were destroyed in the streets where the tidal drains are now built. These receive the discharges of the street surfaces and from all yard sewers, and also from the sewers in all cross streets, besides what is contributed by all yard sewers in the same.

"The tidal drains, when first built, worked admirably under the plan of opening and closing the gates as laid down in the ordinance regulating the duties of the tidal drain-keeper.

"According to high medical authority here the exemption of Charleston from any epidemic of yellow-fever from 1858 to 1871 is due to the sanitary effects of these tidal drains ; and

the recurrence of the epidemic since may be attributed to the fact that from some cause these drains were choked up and were no longer as effectual as originally."

LOUIS J. BARBOT,
City Engineer.

For fuller information on the subject, and up to date, I am gratified to have learned that a paper will be presented by Mr. Barbot, which, I have no doubt, will make still more apparent the cause of the inefficiency which now obtains in this system.

It would be an easy matter to extend this paper almost indefinitely by particularizing the mechanical arts as applied to house drainage, lavatory apparatus, ventilating, heating, and cooking inventions ; life-saving apparatus ; school furniture ; gymnastic apparatus ; disinfecting plants ; garbage destructors ; the sterilization of milk, preparation of meat extracts, food compounds : all important subjects which no votary of Preventive Medicine can afford to neglect. And above all, as an aid to science, the microscope, in regard to which the world-renowned Professor Koch is reported to have said recently :

" No, the world must not thank me. The makers of modern microscopes should be thanked. Ten years ago, with the microscopes then in use, the bacillus of tuberculosis was invisible. Let them keep up their good work and there will not remain invisible a single malevolent animalcule to prey upon the human frame.

" When there is no more fighting in the dark medical men will fight with better success."

Many mechanics there are now who proceed upon recognized principles based upon mathematical rules and the laws of physics ; these and their works are no less scientific than the work of the chemist or the bacteriologist. On the other hand, there are not a few who, without any scientific knowledge, experiment at random, who copy and undertake to combine the results obtained by other and better inventions with their own crude devices, which they call new, and for which they claim extraordinary advantages. Devices of this kind bear the same relation to the mechanical arts based upon scientific principles as the pretentious specifics of empirics

who follow in the wake of curative medicine. But neither the medical practitioner nor the practical sanitarian can afford to ignore such devices.

The most effectual way of repressing empiricism is to become acquainted with its devices and expose them. To ignore it is to multiply its dangers.

Empirical productions generally, whether in the wake of medical practitioners, the mechanical arts, or otherwise, are, on the whole, much like counterfeit money, mischievous proportional to the amount in circulation. Its detection depends upon a close inspection of its characteristics as compared with a thorough knowledge of the genuine article.

A NEGLECTED CHILDHOOD.—Paternal care had not yet come into fashion ; the fashion was, indeed, the reverse, when I was a child ; thus, my early years were cheerlessly spent in an outlying district of Paris. At the age of four, I was still there, when I accidentally fell from the top of a cupboard, and dislocated my foot. The woman to whose care I was intrusted only informed my family of this several months afterward. The dislocation of my foot had been neglected too long to be remedied ; even my other foot, having had to bear alone the whole weight of my body, had grown weaker, and thus I remained lame for life.

That accident had a great influence over my after-life. It, indeed, led my parents to think I was unfit for a military career, or, at least, that in such I should labor under great disadvantages ; they were thus induced to seek for me some other profession, which, in their eyes, would be best calculated to serve the interests of the *family*. For, in great families, the *family* was far more cared for than its members individually, chiefly those young members who were still unknown. These considerations are rather painful to my mind, so I will not dwell further on them.—*Talleyrand's Memoirs in the Century Magazine for January.*

EDITOR'S TABLE.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

THE AMERICAN PUBLIC HEALTH ASSOCIATION.

THE Eighteenth Annual Meeting was held at Charleston, S. C., December 16th-19th, 1890. The meeting was characterized by an unusual proportion of members from distant places. Members from the Southern States, excepting North Carolina, Florida and Tennessee, were conspicuous by their absence, while the Northern States and Canada were, as usual, well represented ; and, for the first time, the Superior Board of Health of Mexico was represented by two members. Thus, the Association, which is already one of the largest organizations in the world devoted to the promotion of health, is making signal progress in its purposes by continually extending its influence and scope.

The benefit of co-operative work on the part of the sanitary authorities of Mexico with those of the United States can be best conceived by those who have a clear recollection of several epidemics of yellow fever which have been introduced into this country in default of any such co-operation ; and by those who recognize the constantly menacing attitude of unprincipled traders who set our Southern port regulations at defiance. The aim of the Association is to secure the co-operation of all American countries, and, moreover, to so promote international sanitation that, ere the lapse of another year, it is hoped such headway may be made that *Cuba*, at least, with the sanction of her home government, may appreciate the movement and unite in the effort against the common enemy to health and commerce. Such a union is eminently worthy of the most assiduous effort by the Executive

Committee, and it should be kept in the foreground of the objects to be accomplished at the next annual meeting.

THE PROCEEDINGS.

The sessions were held in Hibernian Hall.

FIRST DAY, DECEMBER 16TH.

Dr. J. B. BAKER, of Michigan, opened the meeting at 10 o'clock with a brief address, and introduced Dr. H. B. HORLBECK, Chairman of the Committee of Arrangements, who welcomed the Association to the city and extended many invitations to visit and partake of the hospitalities of various social and other organizations, and to public institutions. Dr. J. BERRIEN LINDSLEY, of Tennessee, treasurer, submitted his annual report, showing a balance of \$1100 in the treasury.

Dr. IRVING A. WATSON, of N. H., secretary, who, at the Brooklyn meeting of the Association, a year ago, was instructed to correspond with the authorities of Mexico with a view of having that government co-operate with the Association, reported that the correspondence was effectual, as was shown by the presence of delegates from Mexico on the floor.

On motion of Medical Director GIHON, U. S. Navy, a resolution was adopted welcoming the delegates from the Superior Board of Health of Mexico, Drs. OZVANANOS and GOMEZ.

About fifty members were then elected to membership, representing various parts of the country.

INVITATION TO VISIT AIKEN.

After the election of new members, Dr. B. F. WYMAN, of Aiken, was granted the privilege of the floor and, in behalf of the city, said that it was the desire of the people of Aiken to have the Association visit their city. He had the honor to extend the invitation of the mayor, board of trade and people, to the members of the Association, and that when the people of Charleston had let them go the people of Aiken would be glad to take care of them and keep them as long as they would stay. The invitation was received with applause. Upon motion of Dr. RAYMOND, the invitation was accepted with thanks.

The presentation of papers being announced as the next business in order, the first was on

"THE FEDERAL DISTRICT IN THE REPUBLIC OF MEXICO AS A SUITABLE RESIDENCE FOR PERSONS PREDISPOSED TO TUBERCULOUS AFFECTION AND FOR THE RELIEF OF PULMONARY CONSUMPTION, BY DR. DOMINGO OZVANANOS, MEMBER OF THE SUPERIOR BOARD OF HEALTH OF MEXICO." (TRANSLATED FROM THE SPANISH.)

It was read by Dr. GIHON. The paper gives a very full description of the topography and climate of the country and contains much valuable information. It is our purpose to publish it in full in the February number.

Dr. L. F. FLICK, of Philadelphia, read a paper on

"THE PREVENTION OF TUBERCULOSIS; A CENTURY'S SUPERVISION IN ITALY, UNDER THE INFLUENCE OF THE PREVENTIVE LAWS OF THE KINGDOM OF NAPLES, ENACTED IN 1782."

This paper is also replete with information of interest and practical importance ; and it, too, will be published in full in our pages at an early date—probably in February.

VENTILATION AND IMPURE AIR AS PROPHYLACTIVE OR CAUSATIVE OF DISEASE,

by Dr. REMONDINO, of San Diego, Cal., was presented and read by title only.

The next paper was on

THE PREVENTION OF PHTHISIS,

by Dr. WYMAN, of Aiken, S. C. It showed the importance of Aiken as a health resort for consumptives.

These papers, all treating upon tuberculosis, with special reference to its prevention, awakened a prolonged and lively discussion. The consensus of opinion appeared to be in the direction of more stringent regulations for its prevention, especially as applied to people living mostly in closed apartments, such as hotels, boarding-houses and health resorts, and

to travellers in steamers and cars, and especially in sleeping-cars.

Dr. GHON, of the U. S. Navy, offered the following resolution, which was adopted : "That a standing committee of five members be appointed by the president to formulate practical prophylactic measures, for the prevention of the spread of tuberculosis, especially looking to the protection of the healthy members of the community from tuberculous infection."

An interesting fact brought out in the discussion was that the Japanese dispose of their sputa by means of the cheap paper handkerchiefs, which they conceal in their sleeves and destroy by burning. It was also stated that the washerwomen at Aiken, S. C., are especially liable to tuberculosis.

Afternoon Session.—Dr. GHON presented, on behalf of the author, and read a paper on

SWINE-RED DISEASE OF MEXICO,

by Dr. JOSÉ L. GOMEZ, of Mexico. A disease of hogs, the symptoms of which, together with the pathological appearances, were so minutely and so accurately detailed by the writer as to provoke the inquiry whether the disease in question was not identical, or nearly so, with hog-cholera, to which the author replied in the affirmative.

A paper on the

SANITARY ADVANTAGES OF THE TURKISH BATH,

by Dr. C. H. SHEPARD, of Brooklyn, N. Y., in the absence of the author, was read by Dr. BAILEY.

Professor F. P. VENABLE, of the University of North Carolina, read a paper entitled

SOME NOTES ON CHEMICAL DISINFECTION,

being a *résumé* of the present aspect of the subject of chemical disinfection.

The discussion which followed was very largely participated in by the Association, and took a different turn from that which the writer had plainly sought. The discussion was mainly devoted to the possible harmful effects which might

result from the excessive use and application of the bichloride of mercury as a disinfectant. The opinion of those who took part in the discussion appeared to be very much divided upon the subject, but, for the most part, seemed to think there was but little danger in the use of the bichloride under the directions so lucidly formulated in the report of the Committee of the Association, published three years ago.

The evening of the first day was devoted, as usual, to the president's address and to the formal reception of the Association by the city authorities. The meeting was held in the Grand Opera House ; and, in consequence of the unusually low temperature, the audience was small.

THE ANNUAL ADDRESS

of Dr. BAKER, the President of the Association, is published in full on other pages of this number.

It is eminently worthy of careful reading by all who would understand the scope of the Association and the progress of practical sanitation.

The other exercises of the evening consisted in addresses of welcome by eminent citizens, Dr. BUIST, representing the medical, and J. D. K. BRYON, Esq., the legal professions. Both addresses were exceedingly cordial and eloquent.

The Rev. Dr. VEDDER, the eloquent pastor of the Huguenot Church, closed the programme with a constant fusillade of wit and humor.

The speaker went on to formulate the charge against the Health Association, of seeking to find and eradicate the seeds of human malady, and thus interfering with the livelihood of our many and good and well-beloved physicians, taking the bread out of their mouths by forbidding them to put bread pills in the mouths of others. And though our doctors gave them welcome and were glad of their advice and aid in thus playing at cross-purposes with their bread and butter, yet the community would not stand silently by and see its endeared medical men thus ruthlessly immolated upon the altar of self-sacrifice ; and, therefore, the community had adjudged that the members of this Public Health Association should be visited and persecuted by all forms of public and social attention

and courtesy, be immured in a building where they must wrestle with bacteria, bacilli, mephitic vapors and miasmatic conditions, and like savory matters, while the community looked on, uninterfering and unpitying. From time to time, to aggravate their imprisonment by contrast, they were to be taken out and around our city, to bemoan the fate that compelled them to live elsewhere, save, of course, in the favored localities, so much like Charleston, where they did reside ; taken into our homes, so much sweeter than any others, except, of course, their own ; be made to get, if not " half seas over," at least " over the bay," by being taken down to the Bar ; be invited to ride in railway coaches where no dust could penetrate ; and to explore our splendid system of drainage, without any drain upon their susceptible olfactories, etc., etc.; and when they had reached the limit of human endurance, and were ready to go, to see their persecutors so unaffected by compunctions as to be willing to endure the whole programme, and hear them giving to the Health Association the hearty send-off : " Come again, as soon, as often, and in as great force as possible." The jury of the city has been polled, and it cries : " So say we all."

SECOND DAY, DECEMBER 17TH.

The first regular paper of the second day's session was a report of the Committee on DIPHTHERIA, presented by Dr. ASHMUN, of Cleveland, O., the chairman of the committee. The report estimated the annual mortality from this disease in the United States and Canada at 10,000, and the number of cases 40,000. Climatic, local and contagious causes were enumerated by the Committee, as well as the probability that domestic animals may be concerned in its spread. The apathy of boards of health in resisting its spread was especially noted, and the establishment of disinfecting stations and the isolation of diphtheria patients advised.

A lengthy discussion followed, in which the prominent fact brought out was the permanence of the infection in houses and apartments once infected.

This report is replete with information of practical importance to all health authorities, and is worthy of the widest

dissemination among them. We hope to make room for it entire in these pages at an early date.

Dr. RAUCH, of Chicago, introduced a resolution looking toward adding to the regular quarantine diseases, diphtheria, typhoid-fever, measles, and chicken-pox. This, he thought, was necessary in addition to the present regulations regarding small-pox, yellow-fever, and cholera. This regulation he regarded as necessary for all emigrant steamers.

Dr. T. F. WOOD, of North Carolina, introduced a resolution that the American Public Health Association co-operate with the American Medical Association in preparing statistics and a history of vaccination, and raise a fund for erecting a monument to Jenner, the discoverer of vaccination against small-pox.

On motion of Dr. J. H. RAYMOND, of Brooklyn, it was voted to adopt the report of the Local Committee on the Sanitary Exhibit, at Brooklyn, and that it be published in the next volume of the proceedings.

Dr. SMART, of the U. S. Army, of the Committee on the Pollution of Water, regretted that the committee was not prepared to make a final report. A full report at this time would be impossible.

On motion of Dr. GHION, it was voted that the Committee on Water Pollution be continued.

WHAT CONSTITUTES A FILTH DISEASE?

by SAMUEL W. ABBOTT, of Massachusetts, was the next paper, which was remarkable for its comprehensiveness and practical utility alike to the household and the health service. It is our purpose to present it in full as early as practicable.

Dr. GEORGE T. KEMP, Director of Physiology and Experimental Therapeutics at the Hoagland Laboratory, of Brooklyn, N. Y., read a brief paper upon

THE VALUE OF MICROSCOPICAL, CHEMICAL, AND SPECTROSCOPICAL EXAMINATIONS OF BLACK VOMIT, AS AN AID TO HEALTH OFFICERS IN THE DIAGNOSIS OF YELLOW-FEVER FROM MALARIAL-FEVER.

He had made cultures, and presented samples in tubes in illustration of his subject. This paper we also hope to find room for entire in a future number.

CAR VENTILATION.

In the afternoon, the Association enjoyed a diversion from its usual programme, by taking a trip of about twenty miles out into the country, to visit an old historic building, the old church at Goose Creek, built in 1706. It is in a comparatively deserted region, surrounded by the immense live-oaks with hanging moss and other semi-tropical plants of this climate. Attached to the train which conveyed the Association was a car ventilated by a new method, the motive power for producing a current of air being furnished by the wheels of the car. The fresh air, when introduced, is deprived of its smoke and cinders by passage through water. The air passes into the car through small tubes at the sides of the car, and the foul air is withdrawn at the top. Whatever may be the finding on further examination of the process by a duly authorized committee, it may be safely said that, so far as it was possible to judge of the operation of the device as presented on this occasion, its effect was thoroughly successful.

At the evening session of the second day, Dr. J. H. RAYMOND, of Brooklyn, N. Y., presented two papers, which were illustrated by stereopticon views. The first paper was upon the

TREATMENT OF SEWAGE BY PRECIPITATION AND SATURATION.

This was especially illustrated by a description of the process now employed for sewage disposal at Coney Island and one or more other places. The precipitants employed were lime and chlorine. The daily amount treated was about 50,000 gallons, at a cost of \$6.50, or thirteen cents per 1,000 gallons. The claims which were urged for this system were : Concentration of the plant, absolute control of effluvium, economy of operation, convenient form of sludge removal, and immunity from infection.

Dr. Raymond's second paper treated of the

SANITARY IMPROVEMENT OF STAGNANT LAKES NEAR THE SEA-SHORE.

The ingenious plan adopted consisted in the letting in of sea-water through a trench or canal, the level of which was such that the waves of the sea at high tide each day broke over a

weir and passed into the lake or pond, converting it from a fresh water lake to a salt one. The lake was shallow, and of about eighty acres in area.

Dr. A. N. BELL presented a paper on

THE RELATION OF THE MECHANICAL ARTS TO PREVENTIVE MEDICINE, PARTICULARLY ILLUSTRATED BY THE ARTESIAN WELLS AND TIDAL DRAINS OF CHARLESTON,

published in full on other pages of this number.

Mr. L. J. BARBOT, the City Engineer of Charleston, followed, with a paper on the

SEWERAGE SYSTEM OF CHARLESTON,

which consists of tidal drains. The early drains of the city were defective, and were but little better than elongated cess-pools. Yellow-fever was then very prevalent. The tidal drains are furnished with tide-gates, by which they can be flushed out daily under a pressure of about four feet of water. The earthquake of 1886 caused serious disturbance to their level, and they are, at present, in great need of repair.

THIRD DAY, DECEMBER 18TH.

Dr. P. H. BRYCE, of Toronto, Secretary of the Provincial Board of Health, presented a paper on

UNDERGROUND WATER FOR PUBLIC PURPOSES.

The facts relative to the geological strata in which underground water supplies are usually sought were clearly stated, but when the author proceeded to elucidate his theories of capillary attraction as controlling the movements of underground waters, his explanations were somewhat obscure. On the whole, however, the paper comprised a good deal of useful information with regard to the danger of fouling water-supplies from too frequently unsuspected sources.

REPORT OF THE NEW ENGLAND KITCHEN.

Dr. ABBOTT, of Massachusetts, after a few remarks on the excellence of Mrs. ABEL'S Lomb Prize Essay on Cooking,

presented a number of copies of the institution organized in Boston by Mrs. E. H. Richards and Mrs. Abel for the furnishing of wholesome and nutritious articles of food, at low prices, to the poor. The institution described in this report was now in practical operation in Boston, and fully illustrated the excellence of Mrs. Abel's essay.

Dr. MONTIZAMBERT, of Quebec, presented a paper on

THE VACCINAL PROTECTION OF PASSENGERS FROM CUBA.

He showed that small-pox, when occurring in America, is almost invariably introduced from foreign ports, and that there was great need for more stringent laws requiring vaccination of all persons coming into the country. The nation demanded such protection, and he hoped that the Association would do its best to secure the necessary legislation.

A BREEZE.

Dr. GHION, U. S. Navy, said he was sorry that the members of the faculty of the Medical College had not attended our meetings. He understood that they were chagrined at something. If there was any chagrin it ought to be on the part of the Association. It was not the custom of the Association to extend special invitations, for the members of local faculties generally attended the meetings. But, as there might be a misunderstanding, he moved that a special invitation be extended to the members of the faculty, and that the regrets of the Association be expressed.

Dr. HORLBECK, Chairman of the Local Committee, said : " I would say in explanation that the President of the Medical State Board was placed on the Executive Committee ; the Hon. Charles H. Simonton, Chairman of the Board of Trustees of the College, was also put on the committee. Circulars have been sent out, the meeting has been well advertised, and everybody has been invited. I could not go to each gentleman in town and ask him to come to the meeting."

Dr. Horlbeck's explanation was received with applause, and Dr. Gihon immediately withdrew his motion and apologized to Dr. Horlbeck for introducing it, but explained that it was

done to get an explanation, which he knew would be forthcoming.

Dr. PLUNKETT, of Tennessee, introduced a resolution which intended to impress upon the quarantine officers of the country the necessity of increased vigilance against cholera, which is said to be now raging in foreign ports. Referred to the Executive Committee.

Dr. LEE, of Pennsylvania, introduced a resolution which requested quarantine officers to be careful and, if possible, restrict the importation of rags from foreign ports. Referred to the Executive Committee.

Dr. CONN, of New Hampshire, submitted a report upon the Disposal of Garbage and Refuse. The report was read by title, and will be published and distributed. The work of the committee consists of an examination of the processes now in use for the disposal of garbage, and the best methods for its destruction.

Dr. BELL, of New York, introduced a resolution for the appointment of a committee of which Dr. Rauch, of Illinois, should be chairman, to inquire into the expediency of and with power to make arrangements for a Sanitary Exhibit at the World's Fair, in 1893.

MARITIME SANITATION AT PORTS OF ARRIVAL.

Dr. H. B. HORLBECK presented a valuable historical account of the various epidemics of yellow-fever at Charleston in past times, in consequence of the bad local conditions and imperfect quarantine regulations at that port. He proceeded to describe the new quarantine station and the methods recently devised and adopted for the disinfection of merchandise and ships, which the Association was now invited to visit.

THE TRIP AROUND THE HARBOR

was made in the United States revenue cutter, *Lot M. Morrill*, Captain Baldwin in charge. Dr. Horlbeck looked after the pleasure of his numerous guests.

The Cutter left the Custom House wharf promptly at 1 o'clock, and it was 5 when the disembarkation took place. The course of the expedition was out into the harbor, passing

near Forts Sumter and Moultrie, and thence to Fort Johnson, where the party got off and critically inspected the quarantine station. The plant was examined with much interest and discussed by those who were familiar with the subject. The quarantine officer, Dr. Lebby, was found to be familiar with every detail, and was confident that with the present appurtenances he was able to cope with any contingencies likely to arise. All seemed pleased with the manner and work of the station.

Leaving the quarantine station, the *Morrill* returned by the city front and gave the visitors a picturesque panorama of the city. Going up the Cooper River some distance, the vessel made a short excursion into Wando River, and steaming down the bay returned to the Custom House wharf.

A substantial and well-prepared lunch was served on the return trip. Dr. Horlbeck, Mr. Tobias, and the other members of the committee, with Collector Johnson and Captain Baldwin, gave the party a most delightful and interesting excursion in all respects.

Evening Session.—Dr. J. F. HIBBERD, of Indiana, presented a paper entitled the

HYGIENIC VALUE OF RATIONAL IRREGULARITIES IN HABITS OF LIVING.

He described the conditions of two young men living under different modes of life, hypothetical and exaggerated cases being purposely presented for the purpose of illustrating his subject. The formation of regular habits in eating, sleep and exercise was especially enjoined.

The next paper was entitled

LAND MONOPOLY IN RELATION TO POPULATION AND HEALTH, in which the author, Dr. HOMAN, of St. Louis, endeavored to show that monopoly of land was inimical to public health. The sociological rather than the sanitary element predominated in the paper. The writer claimed that there should be no monopoly of land, unless monopoly of the air, water, and sunlight were also permitted.

Four papers were read by title only, their subjects being as follows :

"Climate in Phthisis," by Dr. GEDDINGS, of Aiken, S. C.; "House Drainage," by A. L. WEBSTER, C.E., of New York; "Trap Siphonage," by Professor J. E. DENTON, Hoboken, N. J.; "Report from State Board of Health of South Carolina," by the President of the Board, Dr. BRATTON; "Leprosy, and its Management in Minnesota," by Dr. CHARLES N. HEWITT.

FOURTH DAY, DECEMBER 19TH.

A resolution was introduced that the Committee on Diphtheria should append to their report a statement of the practicable methods for disinfection in that disease.

It was voted that it was inexpedient to adopt the report of the Committee on the Disposal of Garbage, and to refer the subject to a new committee.

The following officers were elected for the ensuing year :

President, Dr. Frederic Montizambert, of Quebec; First Vice-President, Dr. Thomas F. Wood, of Wilmington, N. C.; Second Vice-President, Dr. Henry B. Horlbeck, of Charleston, S. C.; Treasurer, Dr. J. B. Lindsley, of Nashville, Tenn.; Secretary, Dr. I. A. Watson, of Concord, N. H.

It was decided to hold the next meeting in 1891, at Kansas City, Mo.

The Committee on National Legislation was increased by the addition of Dr. Baker, of Michigan.

ADJOURNED.

Soon after adjournment it was the delightful privilege of many members and the ladies accompanying them to place themselves under the auspices of a special committee to be conducted to and enjoy the hospitalities of Aiken.

On Thursday morning a committee consisting of Dr. B. F. Wyman, Dr. T. G. Croft, Dr. B. H. Teague, Judge James Aldrich, and the Hon. D. S. Henderson went to Charleston, where they held a conference with the gentlemen of the Association and arranged the details of the programme. A special

train was secured from the authorities of the South Carolina Railway, and at 1 o'clock on Friday afternoon it rolled out of the Line Street Station with a party of over fifty guests, who had decided not to leave South Carolina without seeing this famous resort.

After leaving Branchville, a sumptuous luncheon, which had been prepared before leaving Charleston, was served on board the train, and the company grew sociable, not to say merry, as the profusion of delicacies, accompanied by prudent potations of native wines, vanished.

On arrival at Aiken at 4.30 P.M., the visitors were received by the reception committee from the board of trade, and were driven in carriages to the hotels or residences of the citizens who were to entertain them during their brief sojourn. Later in the afternoon the guests were driven through the parks and suburbs, and from the crest of the high hill, upon which stands the Highland Park Hotel, they were greeted with a splendid view of the surrounding country across the deep valley below. By a happy chance the sunset was one of sub-tropical splendor, and the visitors had a fine opportunity to see a southern evening sky at its best.

After resting an hour or two from the drive the guests were conducted to the Highland Park Hotel, where the event of the occasion,

THE BANQUET,

was prepared, and about 9 o'clock the company were ushered into the spacious dining hall, where half a hundred tables, laden with all manner of delicacies, were arranged. The most pleasing feature of the banquet was the presence of a large number of ladies. Those of the visiting party were, of course, present, and the women of Aiken, who are famed for the grace which they can lend to any occasion, came out to extend a warm greeting.

Fewer scenes of greater festivity or of more genuine hospitality have ever been presented anywhere in this Southern country, so famous for the generous reception it always grants to strangers. The great hall, filled as it was with beautiful women arrayed in rare and beautiful costumes, was a sight on which to feast the eyes, casting into the shade the otherwise

exquisite splendor of the fruits and flowers which adorned the walls and tables.

The feast of wit and flow of soul that followed abundantly demonstrated that the entertainers fully understood the basis upon which the entertained relied for their vigorous health, and well knew how to bring it out. The guests were admirably prepared to enjoy the exhilarating effect of the delightful drive on the next day, during which they took in all the surroundings and realized, for the time being, the health-bestowing effects of the pine-groves, the delightful atmosphere and beautiful site of Aiken amply justifying all that is claimed for it as one of the most favorably situated health resorts in the world.

THE NEW SURGEON-GENERAL, U. S. ARMY.—The Washington correspondent of the *New York Medical Journal*, January 3d, says: "The appointment of Colonel CHARLES SUTHERLAND to be Surgeon-General of the Army gives great satisfaction here, where the medical department of the army is deservedly popular. His friends successfully made the contention, as against one of the other applicants, that Dr. Sutherland had served many years with troops in the field; that he had served in every territory and in Indian campaigns, and was thus entirely familiar with the actual wants of the service; that, if he had not many medical men backing him outside of the service, it was because he had never been permanently stationed in Washington, where he could work up influence; and that, if an officer who had not been thus identified with troops was appointed, the effect would be demoralizing, and the *Pinafore* rule might as well be adopted at once. The *Pinafore* rule, it will be remembered, was thus announced by 'Sir Joseph Porter, K.C.B.' :

' Stick to your desk and never go to sea,
And you all may be rulers of the Queen's Navee.' "

Notwithstanding, by a strict observance of the rights of seniority, Medical Director CHARLES PAGE, who entered the service December 2d, 1851, should have been appointed Surgeon-General instead of Colonel Sutherland, who entered the service more than a year subsequently.

THE TRUTH ABOUT VACCINATION—FORESHADOWED CONTROVERSY.

THE *Medical Tribune*, EDITORIAL OFFICE,
124 WEST 47TH STREET, NEW YORK, Dec. 6, 1890.}

A. N. BELL, M.D.

DEAR DOCTOR : In the November issue of THE SANITARIAN you publish an article on "The Protective Power of Vaccination," which is moderate in its claims in comparison to other articles I have read. Yet even Dr. Corbally cannot stand the test of scientific criticism in face of such facts as have been brought to light by Dr. Charles Creighton, of London, in his book entitled "Jenner and Vaccination," and by Professor Crookshank, of King's College, London, in his "History and Pathology of Vaccination." I have long held that vaccination would in time be relegated to the long list of medical fallacies, and such works as I mention seem to indicate that it will not be long before that time comes.

Will you give space in your pages to a presentation of the case against vaccination, either over my signature or a *nom de plume*? I ask this instead of sending an article, for the reason that nearly all the journals deem it important to publish articles in support of vaccination, yet decline to publish anything against it on the ground that it is an established scientific fact. The recent hearings before the Royal Commission in England show at least that there are two sides to the question ; but I am sorry to say that, as a rule, physicians only know one side.

I can make the article any desired length, but to do it justice, it should cover at least from twelve to sixteen pages.

It seems to me that such a discussion would be highly appropriate for your journal.

Yours truly,

R. A. GUNN.

THE SANITARIAN, BROOKLYN, N. Y., Dec. 10, 1890.

DEAR DR. GUNN : In reply to your letter of 6th inst., THE SANITARIAN will be open to you for the discussion of, say, "The Truth about Vaccination," on the following conditions : First, that you publish Dr. Corbally's paper, referred to in your letter, entire, in the *Medical Tribune*, as a basis for controversy. So state, if you see fit, editorially, in the same number, but without attacking the paper, promising your criticism or reply in

subsequent number. I will accept and publish in THE SANITARIAN your first paper or criticism on the basis of controversy, and my reply thereto together in THE SANITARIAN, you to do the same in the *Medical Tribune*, and so on monthly, say for three months, limiting ourselves to four pages each only monthly to the end of the controversy. I will not object to a further continuance—to four or five months instead of three—rather than to occupy more than eight pages for the subject monthly.

To carry out this proposition (for our papers to appear together in each number) it will be necessary for you to send me a copy of yours a month before the time of intended publication, that you may have mine to follow in the same number. I further suggest, for the satisfaction of our readers, we both publish this correspondence—your letter and this, my reply, if my proposition is accepted by you. And lest you may not have kept a copy of your letter, I inclose it for you to take one and return it to me as soon as you have done so. But as I expect to be out of the city from Friday, 12th inst., for about ten days, I must now defer all further consideration of the subject until after my return.

Truly yours,

A. N. BELL.

Dr. ROBERT A. GUNN,
Editor Medical Tribune,
New York.

A. N. BELL, A.M., M.D.

NEW YORK, Dec. 14, 1890.

DEAR DOCTOR: In reply to your favor of 10th inst., I would say that I accept your terms for a discussion of "The Truth about Vaccination." I shall publish Dr. Corbally's paper and this correspondence in the January issue of the *Medical Tribune*, and shall forward my first article in a few days. The limit of four pages in which to answer a twelve-page article will compel me to confine my criticism to special points of the doctor's article.

An honest discussion of this question cannot fail to prove interesting to the readers of both journals; and, of course, we will each hope to convert those who think differently from ourselves.

Yours truly,

R. A. GUNN.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

COMPILED BY HARRY KENT BELL, M.D.

CORRESPONDENTS under this head are particularly requested to be prompt.

ALABAMA.—*Mobile*, 40,000: Reports 78 deaths during November, of which 15 were under five years of age. Annual death-rate, 23.4 per 1000. From zymotic diseases, 11, and from consumption, 14.

CONNECTICUT.—For the month of November the Secretary of the State Board of Health reports 934 deaths in 168 cities and towns aggregating 744,278 inhabitants, showing the temporary annual death-rate for the State to be 15.0 per 1000. The mortality from zymotic diseases was 145, being 15.5 per cent of the total. From consumption there were 123 deaths.

New Haven, 85,830: Total deaths, 108—15 under five years of age. Annual death-rate, 13.4 per 1000.

Hartford, 53,000: Total deaths, 82—17 under five years of age. Annual death-rate, 15.8 per 1000.

Bridgeport, 48,740: Total deaths, 64—16 under five years of age. Annual death-rate, 15.2 per 1000.

Waterbury, 33,180: Total deaths, 38—5 under five years of age. Annual death-rate, 13.7 per 1000.

DISTRICT OF COLUMBIA, 250,000: Total deaths in five weeks ending November 29th, 453—135 under five years of age, and 190 in the colored population. Annual death-rate, 18.4 per 1000. From zymotic diseases there were 96 deaths, and from consumption, 72.

THE DISTRICT HEALTH OFFICER, Dr. SMITH TOWNSEND, is pleased at the passage of the act requiring compulsory notification of cases of scarlet-fever and diphtheria. He had advocated its enactment in substantially the same form for many

years, but finally the medical society appointed a committee, consisting of Dr. Hamilton, Dr. McArdle, and Dr. Franzoni, to draft a bill, and on their report the proposed bill was debated, amended, and, after considerable discussion, passed without opposition. The bill finally passed Congress without important change and is now a law. The health office will send out the blank forms for reports in a few days.

FLORIDA.—Month of October, 1890. Reports from 20 counties show a total of 219 deaths, including phthisis pulmonalis, 26, and enteric-fever, 11.

Pensacola, 15,000 : Month of November, 1890. Total deaths, 21, including phthisis pulmonalis, 3, and enteric-fever, 2.

ILLINOIS.—*Chicago*, 1,100,000 : During the month of November there were 1480 deaths—530 under five years of age, representing an annual death-rate of 16.15 per 1000. From zymotic diseases there were 288 deaths, and from consumption, 143.

INDIANA.—*Evansville*, 50,600 : Month of November, 1890. Total deaths, 61, including phthisis pulmonalis, 9 ; diphtheria, 5 ; enteric-fever, 4 ; and croup, 1.

IOWA.—*Keokuk*, 18,589 : Month of November, 1890. Total deaths, 15, including phthisis pulmonalis, 1 ; diphtheria, 2 ; croup, 2 ; and scarlet-fever, 1.

LOUISIANA.—*New Orleans*, 254,000 : During the four weeks ending November 29th there were 607 deaths—181 under five years of age, and 217 in the colored population. Annual death-rate, 31.17 per 1000. From zymotic diseases there were 110 deaths, and from consumption, 70.

MARYLAND.—*Baltimore*, 500,343 : Reports for five weeks ending November 29th, 768 deaths—234 under five years of age. From zymotic diseases there were 115 deaths, and from consumption, 107. Annual death-rate, 16.27 per 1000.

MASSACHUSETTS.—*Fall River*, 75,000 : Month of Novem-

ber, 1890. Total deaths, 109, including phthisis pulmonalis, 11; enteric-fever, 9; diphtheria, 2; and croup, 2.

Boston, 446,507: Reports for November 723 deaths—192 under five years of age. Annual death-rate, 19.43 per 1000. From zymotic diseases there were 88 deaths, and from consumption, 113.

MICHIGAN.—For the month of November, 1890, compared with the preceding month, the reports indicate that cerebro-spinal meningitis, puerperal-fever, and inflammation of kidney increased, and that cholera-infantum, dysentery, inflammation of brain, diarrhœa, cholera-morbus, typhoid-fever, pleuritis, measles, and whooping-cough decreased in prevalence.

Compared with the average for the month of November in the four years 1886-89, cholera-morbus, influenza, inflammation of kidney, and scarlet-fever were more prevalent, and typho-malarial-fever, whooping-cough, dysentery, measles, inflammation of brain, inflammation of bowels, cholera-infantum, and puerperal-fever were less prevalent in November, 1890.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of November, 1890, at sixty-five places; scarlet-fever at sixty-eight places; typhoid-fever at fifty places, and measles at twenty-three places.

Reports from all sources show diphtheria reported at ten places more, scarlet-fever at eleven places less, typhoid-fever at forty-six places less, and measles at five places more in the month of November, 1890, than in the preceding.

Detroit, 220,000: Reports for November 284 deaths—63 under five years of age. Annual death-rate, 15.70 per 1000. From zymotic diseases there were 71 deaths, and from consumption, 32.

Grand Rapids, 75,000: Month of November, 1890. Total deaths, 70, including phthisis pulmonalis, 6; enteric-fever, 5; scarlet-fever, 1; diphtheria, 7; and membranous croup, 3.

MINNESOTA.—Month of November, 1890. Total deaths, 812, including enteric-fever, 36; scarlet-fever, 6; diphtheria, 78; and measles, 3.

St. Paul, 150,000: Reports for November 114 deaths, of which 58 were under five years of age. There were 32 deaths

from zymotic diseases, and 7 from consumption. Annual death-rate, 9.12 per 1000.

MISSOURI.—*St. Louis*, 460,000: Reports during October 576 deaths, of which 167 were under five years of age. Annual death-rate, 15.02 per 1000. From zymotic diseases there were 90 deaths, and from consumption, 62.

KANSAS CITY, 135,000: Reports during November 120 deaths, of which 41 were under five years of age. Annual death-rate, 10.6 per 1000. From zymotic diseases there were 8 deaths, and from consumption, 14.

NEW JERSEY.—*Paterson*, 78,350: Reports for the month of November 132 deaths, of which 53 were under five years of age. Annual death-rate, 19.9 per 1000. From zymotic diseases there were 26 deaths, and from consumption, 14.

NEW YORK.—The Secretary of the State Board of Health reports, in the *Monthly Bulletin*, that the average daily mortality for the past five years has been 260, that of November being 225. In 1889 there were 42 less deaths daily in November than the daily rate for the year, in 1888 there were 53 less, in 1887 there were 21 less and in 1886 there were 9 less per day. The average number of deaths each day for 1890 has been 305, and during November 257, a diminution of nearly 50 *per diem*. The mortality from zymotic diseases has decreased proportionately from 155 deaths in each 1000 deaths from all causes in October to 146 per 1000 in November. It is also lower than the average for November, which is 182 per 1000. All zymotic diseases show lower mortalities except diphtheria, scarlet-fever, and measles. As noted in the last *Bulletin*, diphtheria always shows a marked rise in mortality in October, and the average of five years shows a continuance of this increase through the succeeding two months. There were 72 more deaths from this cause than in October. Scarlet-fever caused 42 more deaths than in October. A number of towns have recently reported outbreaks of these diseases. The increase in measles is moderate. The death-rate, according to the reported mortality of 137 cities and villages, is at the rate of about 18 per 1000 population, and of the rural towns not speci-

fied separately in the *Bulletin* about 13, that of the reporting portion of the State (5,417,000 population) being at the rate of 17 per 1000 annually.

New York, 1,631,305 : Total deaths, 2748—932 under five years of age. Annual death-rate, 20.48 per 1000. From zymotic diseases, 387 deaths, and from consumption, 394.

During the year 1890 the total number of deaths in the city was 40,230, a slight increase over the total of 1889, which was 39,583, as well as that of 1888, which was 40,175. The population being estimated at 1,631,230, the rate of mortality is found to be 24.6 to the thousand, as against 25.1 in 1889, when the population was held to be 1,580,000. From scarlet-fever, in 1890, there were only 403 deaths, against 1239 in 1889, the number of cases being 2893 and 8730 respectively. In diphtheria, also, there was a decline, 1256 in 1890 against 1685 in 1889; the cases, 4142 and 6289 respectively. Typhoid-fever caused 350 deaths, a decrease of 47; the number of cases was 1079, a decrease of 296. Measles caused 724 deaths, an increase of 254; the number of cases was 8972, an increase of 2635. Whooping-cough showed a falling off—namely, 486 as compared with 647 deaths. The deaths by malarial causes were only 174, as compared with 229 in 1889. Small-pox caused two deaths, as against one in 1889. The deaths by bronchitis and pneumonia numbered 1982 and 4950, as compared with 1792 and 4015 in 1889. Consumption is charged with the heaviest item of mortality, 5468, as against 5163 in the previous year. The reported births came quite close to the deaths, being 39,250, a decided increase beyond the total of 37,521 in 1889. The marriages numbered 14,992, while in 1889 they were 14,400.

Brooklyn, 852,467 : Total deaths, 1462—521 under five years of age. Annual death-rate, 21.34 per 1000. From zymotic diseases, 250 deaths, and from consumption, 164.

Health Commissioner Dr. JOHN GRIFFIN has submitted to the Mayor his report of the work accomplished by the department during the year 1890. We make the following abstract :

The average mortality has been slightly increased, showing 23.15 per 1000 for 1890 as against 22.18 per 1000 for 1889, and is due entirely to this cause. Of measles there were reported by attending physicians only 1821 for 1890, as against 4733 for

1889, the mortality for the former year being 205, and in the present year 109.

Scarlatina, one of the most contagious diseases, and whose distribution it is almost impossible to limit, has proved less destructive than in former years.

Diphtheria continues to be a most malignant source of danger to the health and safety of the younger population.

In view of the increased population, the returns for typhoid fever are very favorable, showing an increase of mortality of only eighteen in the present year over the past.

Total number of deaths, 19,773, of which 8444 were of children under five years of age. From zymotic diseases there were 4351 deaths, and from consumption, 2161.

The total number of marriages reported during the year 1890 was 7500; 1889, 7500; births, 1890, 15,000, and 1889, 14,000; still-births, 1890, 1305, and 1889, 1279.

Buffalo, 255,000: Five weeks ending November 29th total deaths, 401—160 under five years of age. Annual death-rate, 16.38 per 1000. From zymotic diseases, 73 deaths, and from consumption, 35.

Rochester, 138,327: Total deaths, 148—37 under five years of age. Annual death-rate, 12.80 per 1000. From zymotic diseases, 26 deaths, and from consumption, 17.

Albany, 103,000: Total deaths, 161—34 under five years of age. Annual death-rate, 19.20 per 1000. From zymotic diseases, 16 deaths, and from consumption, 37.

Syracuse, 87,000: Total deaths, 89—31 under five years of age. Annual death-rate, 12.27 per 1000. From zymotic diseases, 14, and from consumption, 11.

NORTH CAROLINA.—The State Board *Bulletin* summarizes the mortuary statistics of thirteen towns for the month of October as follows: Population, 47,900 white and 39,700 colored. Total deaths, 113—59 colored, and 41 under five years of age. From zymotic diseases there were 30 deaths, and from consumption, 15.

Wilmington, 21,000: Total deaths, 37—16 under five years of age. Annual death-rate, 21.1 per 1000.

Raleigh, 15,000: Total deaths, 20—7 under five years of age. Annual death-rate, 16.0 per 1000.

Asheville, 10,000. Total deaths, 16—6 under five years of age. Annual death-rate, 19.2 per 1000.

OHIO.—From the *Monthly Sanitary Record* of the State Board we take the following report for the month of *October*:

The total number of deaths in seventy cities and towns, with an aggregate population of 1,308,500, was 1674, of which 498 were under five years of age. From zymotic diseases, 357, and from consumption, 191. Annual death-rate, 15.35 per 1000.

Cincinnati, 325,000: Total deaths, 470—139 under five years of age. Annual death-rate, 17.35 per 1000.

Cleveland, 235,000: Total deaths, 372—132 under five years of age. Annual death-rate, 18.91 per 1000.

Columbus, 101,000: Total deaths, 112—30 under five years of age. Annual death-rate, 13.37 per 1000.

PENNSYLVANIA.—*Philadelphia*, 1,064,277: Reports that during the five weeks ending November 29th there were 1787 deaths, of which 567 were under five years of age. Annual death-rate, 17.5 per 1000. From zymotic diseases there were 259 deaths, and from consumption, 241.

Pittsburgh, 240,000: Reports 228 deaths during the three weeks ending November 15th, of which 67 were under five years of age. Annual death-rate, 16.3 per 1000. There were 57 deaths from zymotic diseases, and 19 from consumption.

RHODE ISLAND.—The number of deaths reported during November was 362, in a population aggregating 311,452. Annual death-rate, 13.9 per 1000. There were 39 deaths from zymotic diseases, and 57 from consumption.

Newport, 20,000: Total deaths, 20, including phthisis, 3.

TENNESSEE.—*Memphis*, 62,000: Month of November, 1890. Total deaths, 39, including enteric-fever, 1, and diphtheria, 2.

TEXAS.—*San Antonio*, 50,000: Month of November, 1890. Total deaths, 102, including phthisis pulmonalis, 14; enteric-fever, 3; diphtheria, 1, and croup, 3.

WISCONSIN.—*Milwaukee*, 220,000: Reports for November 259 deaths, of which 85 were under five years of age. Annual death-rate, 14.13 per 1000. There were 63 deaths from zymotic diseases, and 15 from consumption.

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

COCAINE, according to a recent number of *El Siglo Medico*, is employed by Dr. Borington, of Panama, with excellent results in yellow-fever. He uses it to counteract the vomiting which he believes to be the principal cause of fatal results in that disease, on account of the great exhaustion which it produces.

He prescribes the hydrchlorate of cocaine in doses of two centigrammes, to be taken ten to fifteen minutes before food ; if the nausea persists, the remedy may be repeated half hourly. By this treatment the doctor says he has succeeded in lowering the mortality in yellow-fever from 50 per cent to 15 per cent.

PHENIC ACID, it is stated in the same journal, is a prophylactic against cocaine. To prevent poisoning by cocaine, Dr. Stuck advises not to employ the drug except in combination with phenic acid. He recommends two drops of the acid in 3.75 grammes of water, to which is added 0.60 of cocaine. This solution is very stable, and may be diluted when necessary. Stuck says that it does not produce any unfavorable secondary effects, and renders the anæsthetic action of the cocaine more active than the ordinary solution.

NODULED ERYTHEMA in infants, says the *Gazette Hebdomadaire*, has been the subject of a communication by Dr. Comby to the Société Médicale des Hôpitaux, which the *Gazette* says confirms the ideas of Dr. Rondot, formerly published in its columns. Dr. Comby proves, by the study of sixteen cases which he has lately observed, that noduled erythema has nothing in common with rheumatism, nor does he believe in paludal erythema.

The symptoms have been almost identical in all the cases under observation by M. Comby ; the prodromic period is variable, lasting from two or three days to eight, and even to fifteen days ; symptoms of gastric disturbance strongly

marked ; rheumatismal pains scarcely noticeable and rarely observed ; no trace of articular swellings ; no heart disturbance. Anæmia very strongly marked in the great majority of cases, and lasting long after the disease.

The erythematous nodules located as usual on the middle of the legs, on the inner surface of the tibia, on the external surface of the calf of the leg, and sometimes on the thighs. In three cases nodules were present on the forearms. These last, while less in size than those on the legs, were, however, well marked, a circumstance which proves that the effect of the inclination and the weight of the body is not necessary to produce the swelling of the dermal and hypodermal layers.

One or several crops appeared, marked by the echymosis and red patches of different sizes.

Duration of the eruptive period generally eight days ; duration of the disease about fifteen days ; but the period of convalescence is generally much longer than that of the disease. The children remain thin and debilitated during several weeks ; they seem as if recovering from typhoid-fever. The nodular erythema seems to be milder in children than in adults, and the visceral complications have not been observed.

The treatment has always been very simple. Sulphate of quinine in doses of the twenty-fifth of a gramme a day during the fever ; soothing liniment ; cotton dressing to the diseased part ; rest in bed ; purgatives repeated two or three times, during convalescence ; cod-liver oil ; syrup of the iodide of iron ; syrup iodo-tannic, etc.

M. Legroux, relying on the old adage, *natura medicorum curaitones ostendunt*, says he has obtained good results from the use of salicylate of soda in this disease, a circumstance which seems to him to class it among the rheumatismal diseases.

M. Hayem thinks there is always a close relation between this disease and indigestion.

This has been the experience of the translator, and in a case now under treatment, a child five months old, the erythematous eruption began on the neck, with all the other symptoms as described, and extended to the chin and down the surface of the body, causing high fever, wakefulness, and constant moaning, as if in severe pain. This case began on the recovery from a severe attack of bronchitis and indigestion.

RED STOCKINGS.—The *Journal d'Hygiène* reports an interesting fact recently submitted for the consideration of the Council of Hygiene and Public Health, in the Department of the Seine.

A number of infants had been attacked with a severe irritation of the skin and itching after having worn stockings dyed red. One of them presented symptoms resembling active poisoning.

An inquest was ordered by the Prefect of Police, and two pairs of stockings were enclosed in a sealed package and sent to M. Schutzemberger for examination.

The learned specialist of the Council of Hygiene found that the color of these stockings had been obtained from a coloring matter analogous to congo (the coloring principle of benzidine or of tobedine), associated, very probably, with another red coloring matter derived from aniline or its analogues. As a mordant it was necessary to employ tannin and tartar emetic or tartarized antimony.

The examination for arsenic gave positive evidence of its existence, but in quantity too small to permit any responsibility for the accidents to be attributed to it.

In regard to the oxide of antimony, the case was different, for it was found in large quantity.

"Under the influence of the cutaneous perspiration," said M. Schutzemberger, "a part of this agent may be dissolved and cause an irritation of the skin, with the formation of pustules. It is known that the ointment having tartarized antimony for its base is employed for this purpose. If different kinds of material dyed in this way with tartar emetic and tannin cause no inconvenience so long as they are separated from the skin by some other inoffensive material, it is not the same with stockings, which rub directly on the epidermis and cause irritation, more or less extensive and penetrating, when they contain agents such as the oxide of antimony, which may be dissolved by the action of the perspiration."

Having heard the report of M. Schutzemberger, the Council of Hygiene decided that the use of stockings dyed with the aid of metallic preparations should be proscribed and considered as dangerous, especially in the case of infants.

A BROOKLYN POST-GRADUATE MEDICAL COLLEGE.—According to the *New York Medical Journal*, articles of incorporation have been filed in Brooklyn as a first step toward the establishment of a post-graduate hospital and school in that city. The management of the institution will be vested in a board of medical councillors, among whom are Dr. Charles Jewett, Dr. Fowler, Dr. Jeffrey, Dr. Evans and Dr. Butler. The aim of the faculty will be to cover every field of study in surgery and practical medicine. An outdoor department is included in the future scope of the enterprise.

FELLOWS' SYRUP OF THE HYPOPHOSPHITES.—Patrick Doyle, M.D., Queen's University, Ireland, writes :

MR. J. I. FELLOWS.

DEAR SIR : As a constant prescriber of your Syrup of Hypophosphites, perhaps a suggestion to recommend its use in combination with Malt Extract, for severe cases of atonic dyspepsia and general debility in adults and in children of ten years and upward, might be of interest to the profession. My formula is :

Kepler's Malt Extract, 3 parts.

Fellows' Syrup of Hypophosphites, 1 part.

Mix well. Dose in proportion to age.

I have found excellent results from this in many cases of phthisis, where the digestive organs have been impaired.

PLATT'S CHLORIDES.—“As a local application to eroded and lacerated cervices uteri, in the strength of one part to eight of water and glycerine, applied on absorbent cotton, squeezed nearly dry and left in contact with the part for twenty-four hours, I have found it more efficient than the tannin solution hitherto used by me. Care should be taken not to use it too strong. As a disinfectant I have used it in my house for over a year with great satisfaction.”—PAUL F. MUNDE, M.D.—*American Journal of Obstetrics*.

LITERARY NOTICES AND NOTES.

THE BACTERIOLOGICAL WORLD, a monthly magazine of fifty-six pages, edited by PAUL PAQUIN, M.D., V.M., Director of the Bacteriological Laboratory, Missouri State University, and published at Columbia, Mo., at \$3 per annum, is a particularly welcome addition to our exchange list. The special field of labor which it proposes to cultivate is overflowing with fruit in various degrees of excellence. Some of it is already mature, and in the best condition for grasping, but it is unfortunately encumbered with much chaff of which it should be divested. Still more is complicated by the multitude of learners in too great a hurry to become leaders, who proclaim their findings in a crude state, unfit for use. For the re-examination of all such findings, and much more, the Director of the Biological Laboratory of the Missouri State University and a well-chosen corps of collaborators have undertaken, by means of the BACTERIOLOGICAL WORLD, to satisfy one of the most timely needs of the medical profession. The initial number before us, for January, is an admirable beginning. It is embellished with portraits of Pasteur and Koch, who have immortalized their names as the forerunners in bacteriological knowledge. Upon these foundation stones a superstructure is rising which needs the watchful care of every votary of medicine in its best sense. Periodical literature lays the foundation to be subsequently wrought into tomes of knowledge, and periodicals are valuable proportional with the intensity of their concentration upon a special field of labor. The one before us eminently deserves what it should certainly have—the generous support of the medical profession.

HAND-BOOK TO DR. KOCH'S TREATMENT IN TUBERCULAR DISEASE. By EDWARD F. GRÜN, M.R.C.S., L.R.C.P., and WALTER D. SEVERN, A.R.C.S. London : J. & A. Churchill.

An illustrated pamphlet of fifty-eight pages, comprising a summary of Koch's discovery of the *bacillus tuberculosis* and its cultivation ; the "Lymph," or actual fluid injected in his treatment—its strength, dilutions, sterilizations, and the care of

it ; the Injection—antiseptic precautions, etc.; Effects of the Injection—in lupus, chronic affections of the bones and joints, in cases of chronic and acute consumption ; Examples—tables of cases compiled from data obtained principally in the Charity Hospital, Berlin ; Résumé and Remarks—the most complete presentation of the progress made, thus far, in the all-absorbing topic of which it treats.

FUNK & WAGNALL'S STANDARD DICTIONARY OF THE ENGLISH LANGUAGE, now in process of publication, judged by the prospectus and sample pages before us, greatly differs from what we were led to infer it would be when it was first announced. It will be characterized by several new features and improvements in lexicography, of great utility and convenience. Among these may be mentioned, in particular, the adoption of *The Scientific Alphabet*, recommended by the American Philological Association, as an aid to pronunciation ; the *order* of the information sought—on reference, definition, etymology and meaning ; the verification of quotations--where to be found with facility—in addition to name of author ; preferred meaning (American), first, and the same with regard to pronunciation. Several other departures from the "beaten track" of greater or less importance indicate a very thorough survey of the ground, which, taken in connection with the well-chosen specialists in the various departments, seem to promise the highest degree of excellence.

The dictionary will contain over 2100 pages, each page slightly larger than a page of the Unabridged Worcester or Webster. The paper and binding will be equal to that in those dictionaries, and it will contain nearly 4000 illustrations, made specially for this work. The list price, when issued, will be \$10. It will be bound in heavy sheep. Special discount is allowed to advance subscribers. New York : Funk & Wagnalls.

DR. ROBERT KOCH AND HIS WONDERFUL DISCOVERY FOR THE CURE OF TUBERCULAR CONSUMPTION. Translated from the German of Dr. HEINRICH ALBRECHT. Including Dr. Koch's most recent communication on the subject. Price, 10 cents. Boston : Carl H. Heintzemann.

A pamphlet of twenty-four pages, with portrait of Dr. Koch.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS, December number :

Practical Guide to the Demonstration of Bacteria in Animal Tissues. By Dr. H. Kühne.

The Present Position of Antiseptic Surgery. By Sir Joseph Lyster, F.R.S.

Cancer and its Complications. By Charles Egerton Jennings.

The Treatment of Epilepsy. By Dr. Charles Féré.

Hand-book to Dr. Koch's Treatment in Tubercular Disease. By Drs. Grün and Severn.

\$10 a year; \$1 a number. William Wood & Co., New York.

MODERN TREATMENT OF HEADACHES. By ALLEN MC-LANE HAMILTON, M.D., No. 6 of the "Physicians' Leisure Library Series." 12mo, pp. 122. Detroit, Mich.: George S. Davis.

It is almost needless to say that the reputation of the author of this little book is such as to commend it to the attention of all medical practitioners, and the more for the reason that, as he briefly states prefatorily, it is drawn from his own experience, without any great reference to other articles or books, and that the remedies suggested are those in which he believes. It is a valuable addition to much literature upon a subject which engages the attention of all physicians.

FINLAND, the north-westernmost province of Russia, is a country seven hundred miles long and on an average two hundred miles wide, embracing an area nearly one and a fourth times that of the British Isles. It has a commerce of considerable importance, several interesting towns, a university enrolling 1700 students annually, a hardy, thrifty peasant population, and scenery peculiarly and characteristically its own. And yet there is perhaps no other civilized country of equal importance about which Americans know so little. Two very interesting articles on Finland—one by Henry Lansdell, D.D., and the other by Albert Edelfelt—will appear in the February number of *Harper's Magazine*, and will give a succinct and picturesque view of the people and the scenery of this far-away but interesting country. Both articles will be copiously illustrated.

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THE PREVENTION OF TUBERCULOSIS: A CENTURY'S EXPERIENCE IN ITALY UNDER THE INFLUENCE OF THE PREVENTIVE LAWS OF THE KINGDOM OF NAPLES ENACTED IN 1782.

READ AT THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, CHARLESTON, S. C., DECEMBER 16TH, 1890.

By LAWRENCE F. FLICK, M.D., of Philadelphia.

ON July 19th, 1782, the sovereign of the kingdom of Naples gave his sanction to a legal enactment for the prevention of tuberculosis, which, according to De Renzi, the medical historian of Italy, contained the following propositions :

" 1. That the physician shall report the consumptive patient, when ulceration of the lungs has been established, under penalty, for the first offence, of 300 ducats, and upon repetition, of banishment for ten years.

" 2. That an inventory shall be made by the authorities of the clothing in the patient's room, to be identified after his death, and if any opposition shall be made, the person doing so, if he belongs to the lower class, shall have three years in the galleys or in prison ; if to the nobility, three years in the castle and a penalty of 300 ducats.

" 3. That household goods which are not susceptible shall be immediately cleansed, and those that are susceptible shall at once be burned and destroyed.

" 4. That the authorities themselves shall tear out and re-plaster the house, alter it from cellar to garret, carry away and burn the doors and wooden windows and put in new ones.

" 5. That the sick poor shall at once be removed to a hospital.

" 6. That newly built houses cannot be inhabited before one year from their completion, and six months after plastering has been finished and repairing has been done.

" 7. That superintendents of hospitals must keep in separate places clothing and bedding for the use of consumptives. Other severe penalties are threatened to those who buy or sell objects which had been used by consumptives, to servants, members of the family, and to any transgressor whomsoever."

The kingdom of Naples, as it was then constituted, comprised all of the territory of the present kingdom of Italy, which constitutes the provinces of Abrozzo, Campania, Apulia, Basilicata and Calabria*—an area of about 11,291 square miles. Its population at that time was about 4,500,000,† and the population of the same territory at present is about 8,038,186.‡ Politically it formed one government with Sicily, and through its rulers was closely associated with Spain, continuing so until 1860, when all Italy was united under one government.§ The probabilities are, therefore, that the laws for the prevention of tuberculosis extended to the kingdom of Sicily as well as to that of Naples; and it is not at all unlikely that Spanish sentiment and Spanish influence had something to do with their enactment.

How strictly the law was enforced it is now difficult to learn, but the probabilities are that it was well received and scrupulously carried out by the people; for they were thoroughly convinced of the contagiousness of tuberculosis and recognized the necessity of some practical measures for its prevention, even before the law was enacted. De Renzi says that many hardships resulted from its enforcement, because of the interference with the renting of property, inasmuch as the people would not go into a house which was known to have been infected.|| I find no reference anywhere to imposition of penalties, and I am inclined to believe that the law was more strictly

* *Annales d'Hygiene Publique et de Medicine legale*, tome 16, p. 302.

† *Supra cito*, p. 300.

‡ *Statistica dell Cause delle Morte, etc.*, 1887, p. xii.

§ *Cyclopædia Americana*, vol. xv., pp. 19-21.

|| *Storia della Medicina in Italia*, Salvatore De Renzi, vol. v., pp. 511-14.

enforced by the demands of the people than by the execution of the authorities. Efforts were soon made to have the law repealed, but it seems to have been allowed to remain on the statute books until the termination of the government, in 1860. The medical profession was at first almost unanimous in its adherence to the theory of contagion and in its support of the law, but as time rolled on it became nearly as unanimous in its disbelief in contagion, and its opposition to practical measures for the prevention of the disease.* The masses, however, clung tenaciously,† and to this day cling to the belief that the disease is contagious, and have never given up entirely the preventive practices which they acquired during the operation of the law.‡

Whether any laws for the prevention of tuberculosis were ever enacted in any other part of Italy I have been unable to ascertain. About the time that the laws of the kingdom of Naples were being enacted quite a spirited controversy was carried on between some of the most learned medical men of the kingdom of Naples and some of the Solons in medicine of the northern part of Italy, in which the latter opposed the theory of the contagiousness of tuberculosis and the enactment of laws for its prevention, and the former defended them.§ But whether any such laws were passed or not, the people of the northern part of Italy largely held the same ideas about the contagiousness of tuberculosis as their southern neighbors, and undoubtedly instituted preventive measures against the disease, which they continue to practise to this day.

The preventive measures inaugurated under the laws of the kingdom of Naples were based entirely upon empiricism, and for that reason were crude, harsh, and inefficient. It was known that tuberculosis was contagious, but it was not known wherein lay the medium of contagion. It was believed that the breath and the odor given off from the body of the consumptive were infectious, and that consequently it was not only dangerous to be near those affected with the disease, but

* *Storia della Medicina in Italia*, Salvatore De Renzi, vol. v., pp. 511-14.

† *Briefe über Italien*, 1793, bei Wilhelm Xaverius Jansen, pp. 250-51.

‡ *Histoire de la Contagion de la Phthisie Pulmonaire*, par M. E. Boisseau, p. 376.

§ *Storia della Medic.*, etc., vol. v., pp. 511-14.

that anything which had been near them was infectious. The fact that the contagion is confined to the sputa and tubercular pus was not known, and thus the only real sources of danger were in a measure overlooked. With the abstract idea that tuberculosis is contagious as the basis, the most heroic and sweeping preventive measures were haphazardly constructed, many of which could have but little influence in preventing the spread of the disease. The burning of the clothing and furniture used by a consumptive patient, and the cleansing of the house which had been occupied by him from cellar to garret after his death, would afford some protection against the disease; but the patient during his lifetime was allowed to be a constant source of danger to his relatives, friends, and neighbors through the dissemination of sputa and tubercular pus. The only real efficacious measure practised was isolation. Nevertheless, in spite of the oppressive superfluous practices instigated and fostered by the law, and its general defectiveness as a sanitary measure against the disease which it was intended to restrict, it contained some merit, and to some extent fulfilled the object for which it was enacted. Inasmuch, moreover, as the practices which it inaugurated, even though defective, have been pretty well carried out by the people for more than a century, and some restrictive influence upon a disease must necessarily follow a general promulgation of the doctrine of its contagiousness, if it is contagious, it is but fair to accept the result of the operation of this law as a test of the practicability of preventing tuberculosis, and as an argument for or against the theory of its contagiousness. A comparison of the prevalence of the disease in 1782 with its prevalence at the present time will show the practical results of the law.

I have unfortunately not been able to find any mortality statistics for Italy as far back as 1782, and it is not probable that any are in existence.* A good idea of the amount of tuberculosis in the kingdom of Naples and in all Italy can be obtained, however, from contemporary writers, native and foreign. Michele Sarcone, in recounting the diseases which occurred in the kingdom of Naples during the autumn of 1764,

* Briefe über Italien, 1793, bei Wilhelm Xaverius Jansen, pp. 250-51.

ends up by saying : "Consumptives suffered in the largest number, and as for these miserable creatures, they do not easily give up."* Among the most frequent and fatal diseases which occurred that year, he puts down peripneumonia, pleurisy, diarrhoea, and rheumatism. From his description it looks as though many of these cases were acute malignant tuberculosis. The peripneumonias and pleurisies were often so much alike that many took them as the same disease.† In an autopsy of a soldier who died of peripneumonia, he found that "the lungs were adherent at the back to the pleura with such strong adhesions that it was necessary to tear the parts to divide them. The right lobe was extremely swollen, hard, and covered with a yellow, sticky material ; the inside was saturated with black curdled blood ; the bronchial substance was choked up with a dense glutinous material, yellow in places and ash-gray in others, and by a tenacious bloody scum. The left lobe, of a purple color, appeared less swollen than the right, and there was in the middle an obscure beginning of an abscess." The diarrhoeas he describes as sometimes accompanied by most rapid emaciation, and the rheumatisms by ulceration.. As being among not the least of the ills to which human flesh is heir he speaks of a skin disease, which he claims is unjustly called the disease of Naples, and which he says ordinarily terminates in fatal consumption.‡ In his account of the terrible disease which visited Naples that year in the form of a plague, he tells us that it was always accompanied by either a remittent or a continued fever, with a disposition to the breaking down of tissue and the formation of pus, and often terminated in internal and external abscesses and tubercles.§ In those days tuberculosis was not recognized unless it took the form of a slow wasting disease.

One cannot fail to recognize, however, in Sarcone's descriptions tuberculosis of every form—acute miliary tuberculosis of the lungs and pleura, tubercular peritonitis, tubercular meningitis, tubercular arthritis, tubercular adenitis and lupus, all in

* "I tabidi soffrirono moltissimo e di questi miseri se ne perderono facilmente." *Regionat de Mali, etc., Michele Sarcone. Part II.*, p. 658.

† *Supra cito, Part I.*, pp. 166-67 ; pp. 67, 73, 102.

‡ *Regionata de Mali, etc., Michele Sarcone, Parte Prima*, pp. 58, 59.

§ *Supra cito, Parte Seconda*, p. 227 *et seq.*

the most malignant form. If many of the diseases so ably portrayed by Sarcone, and which prevailed in his day to such a vast extent, were not tuberculosis, there is certainly no disease known to modern pathology with which his descriptions so well fit in. His appalling picture of the diseases of Naples is well sustained, and the suspicion that many of the acute forms were of a tuberculous character is entirely borne out by the writings of Dr. Benjamin Pugh, an English physician who visited Italy in 1783. Dr. Pugh says : " As this climate had been so long celebrated for its mildness, I was surprised at the obstinate continuance of the complaints of our own family, and likewise at the numbers of diseased and miserable objects I met in every part of the city. I resolved to visit the hospitals, where I beheld misery in the extreme, fevers of every class, but scarcely one where the lungs had not been primarily concerned ; rheumatisms, dropsies, scrofulas, consumptions, ulcers of every kind, and venereal diseases without number. . . . To what diseases, then, are the inhabitants of this country most subject ? They are troubled with fevers of various kinds, in most or all of which I found the lungs concerned ; scrofulas, rheumatisms, ophthalmias, scorbutic putrid gums with ulcers and eruptions of various sorts. The most prevailing distemper seemed to be a marasmus. I frequented their hospitals often, and found those to be the chief diseases ; all which are familiar to those in the hospitals of Naples and other towns near the sea-coast in Italy. But if the inhabitants themselves, whose very looks betray marks of ill health, afforded not such numerous proofs of the unwholesomeness of this air, I am, alas ! furnished with too many by my unhappy countrymen who wintered there in 1783. There were 24 families, besides several single English gentlemen, the whole of which amounted to 136 persons ; and I believe very few of those who came there on account of the air found expected benefit. I can except only two : one an elderly gouty gentleman, the other a tender, weakly, low-spirited gentleman, with a slow fever at times ; but both had sound lungs. The only consumptive cases which I saw at Nice were six young gentlemen and a lady rather advanced in years, all of whom died in the course of the winter. Three of these young men were so active and cheerful at times, even a day before their deaths, that

there was reason to hope for their recovery. Had they stayed in England, or some parts of the south of France, I firmly believe that four of the six, if not now alive, would at least have protracted their days. I attended a great many of the English, who came to Nice in health, in violent inflammatory fevers, in all of which the lungs were concerned." * Dr. Wilhelm Xaverius Jansen, a German physician, wrote from Italy, in 1793, bearing testimony to the same condition of things. " In the hospitals," he says, " I still found quite a number of chest diseases accompanied by inflammation, seldom, too, as this occurs with us at this time of year. Yet it is not always real inflammation. Mostly they are of a rheumatic character, and common people and soldiers, who expose themselves to wet and cold, are more frequently attacked than cleanly people. Besides these one finds different kinds of consumption ; and these, as it appears, are either transmitted by the parents, or are conveyed by infection." †

The terrible prevalence of tuberculosis in the kingdom of Naples and all Italy, at the time when the Neopolitan laws were introduced for its restriction, is born testimony to, in possibly even stronger terms, by later writers than by contemporaries. De Renzi, the medical historian of Italy, who had access to all of the controversial writings of that day, says : " It has been asserted in this connection, and not through the instrumentality of the government, from which I do not take my information, that consumption had at that time become almost general, and that one could daily see death carry off many citizens and the destruction of numerous families because of the little precaution practised." J. B. Martinez, a Frenchman, wrote from Naples even as late as 1834 : " I am free to say that consumption is not less frequent in this city than in Paris and London. I will add, moreover, that after having visited nearly all the important hospitals of France, Switzerland, England, Scotland, and Italy, I have nowhere seen fatal cases of phthisis in such large numbers as at Naples. It is true that the contagious nature which the Neapolitans ascribe to this unfortunate disease is the cause of always confining to the

* Observations on the Climate of Naples, Rome, Nice, etc., by Benjamin Pugh, M.D., 1784, p. 7.

† Briefe über Italien, 1793, bei Wilhelm Xaverius Jansen, p. 250-51.

same room the victims which it strikes down. But it is also true that the disease is much more frequent. Besides this observation agrees with those of Messrs. Pequin, Terrel, Clarke, Renzi, etc., and is the same as that of travellers, strangers to the healing art, who have written about Italy." In order to fully appreciate Martinez's statements as taken in connection with the contemporary writers I have quoted, one needs to further keep in mind the words of De Renzi, who, when comparing the prevalence of consumption in 1848 with that of 1782, said : " Which state of things ought to be a source of comfort to us now living, as we find it no longer almost general, although the precautions used are less."*

We are so accustomed to form our ideas of the prevalence of a disease upon the percentage of deaths to the number of living people that it may be well to try to make an estimate of the mortality rate from tuberculosis in the kingdom of Naples in 1782.† De Renzi tells us, in 1848, that tuberculosis was not near so prevalent then as it had been when the Neopolitan laws were made. Martinez tells us, in 1834, that consumption was much more prevalent in Naples than it was in Paris or London. The mortality rate from consumption in London‡ and Paris§ in 1834 ranged from 4 to 6 per 1000 living people. It is safe to conclude, therefore, that the mortality rate from consumption in Naples in 1834 could not well have been less than 4 per 1000 living people, and that it probably was more than 6 per 1000. And as De Renzi, who is most excellent authority, informs us that there had already been a great reduction, it will not be overstepping the mark to place the mortality rate from tuberculosis for the kingdom of Naples and for Italy in 1782 at 10 per 1000 living people. That this is, if anything out of the way, an underestimate is not only shown by the descriptions of contemporary writers, but by some hospital statistics which De Renzi gives for the year 1828. Out of 5285 admissions to one of the hospitals of the

* " La quel cosa deve riuscir di conforto per i presenti che non veggono quasi generale, comunque minora sieno le cantele che si usino." *Storia della Medicina in Italia*, De Renzi. Tome V., pp. 511-14.

† *Storia della Medicina in Italia*, Salvatore De Renzi. Tome V., pp. 511-14.

‡ Registrar-General's Report, vol. i.

§ Paris, Vaccher sur Mortalité en, 1865, p. 176.

city of Naples during the year 1828, 1108 were consumptives ; and out of 1366 deaths which occurred in the same institution during that year, 699 were due to that disease.* Now, after making due allowance for the fact that the consumptive poor were being isolated in hospitals at this time, it must not be forgotten that these are the deaths and admissions to but a single hospital, and that Naples at that time had at least four large hospitals. If anything further is needed to complete the picture of the appalling prevalence of tuberculosis in Italy in 1782 it can be found in the reputation which that country bore throughout northern Europe at that time. Medical men of other countries began to advise their people to remain away from those sunny skies which canopied eternal spring, as they believed them to overhang a climate specially adapted to the production of consumption. Pugh wrote, " And to some or all of these causes do I attribute that unbalmy quality of the air of Naples, so peculiarly unfavorable to consumptive lungs." The danger attendant upon a prolonged visit to Italy and the fatality of the Italian climate to persons afflicted with consumption found forcible expression in the proverb, " Vedi Napoli e poi muori,"† " See Naples and then die."

The mortality from tuberculosis in Italy now as compared with then is best shown by the official returns. In 1887 the mortality rate from consumption for all Italy was 1.29 per 1000 living people, and from tubercular affections, including, with phthisis, scrofula, tabes mesenterica, and tubercular meningitis, 1.95 per 1000. During the same year the mortality from consumption and general tuberculosis for the towns and cities of the territory which formerly constituted the kingdom of Naples was 1.16 per 1000 living people ; and for the rest of Italy, for the same diseases and for like towns and cities, 2.20 per 1000.‡ The mortality rate for the city of Naples during the same year from consumption and general tuberculosis was 1.92 per 1000.

* *Topografia di Napoli*, pp. 131-32.

† *Briefe von Dr. Diruf, Deutsche Klinik, Berlin*, vol. xiii., 1861.

‡ The compiler of the mortality statistics of Italy tries to explain the discrepancy in the mortality returns from phthisis between the north and south of Italy upon the ground of substitution of nomenclature, as the deaths from bronchitis in the south of Italy are more numerous than in the north. This is not satisfactory, however, as the excess of deaths from bronchitis in the south over those in the north occurs in persons under 10 and over 50 years of age.

The mortality rate during the same year for other tubercular diseases, such as tubercular meningitis, scrofula, tabes mesenterica, and tubercular arthritis was, for the territory which formerly constituted the kingdom of Naples, .89 per 1000 living people ; and for the rest of Italy .85 per 1000. The mortality rate from the same diseases for the city of Naples during the same year was 1.26 per 1000.*

It will thus be seen from the figures given that there has been a very large reduction in the mortality from tuberculosis in the entire kingdom of Italy, and that the reduction has been particularly marked in the territory which formerly constituted the kingdom of Naples. Italy has at present the lowest mortality rate from consumption of any country in Europe† with possibly the exception of Spain ; and that part of it which formerly constituted the kingdom of Naples is, in the country districts and small towns, practically free from the disease. Forty-five towns in this part of Italy, with an aggregate population of 742,068, had a mortality rate of .58 per 1000 from consumption and general tuberculosis during the year 1887. Ten selected towns, with an aggregate population of 146,924, had a mortality rate of .28 per 1000 from the same diseases during the same year. Four selected towns, with an aggregate population of 36,460, had a mortality rate of .19 per 1000.‡ It is fair to suppose that the country districts in this part of Italy have a still lower death-rate from these diseases.

Expressed in figures, the reduction in the mortality from tuberculosis in Italy since 1782 ranges from 50 per cent to 90 per cent. The much greater reduction in that part which formerly constituted the kingdom of Naples is no doubt due to the immediate influence of the Neopolitan law. This is all the more noteworthy, since at the time that the preventive measures were begun, the disease seemed to be more prevalent in Naples than in any other part of the country. To fully appreciate the magnitude and to understand the entire meaning of this reduction, it must further be borne in mind that Italy has again become, and has been for the last thirty years, a famous resort for consumptive invalids. That the

* Statistica delle Cause delle Morti avvenute in tutti i Comuni del Regno nell'anno 1887.

† *Supra cito.*

‡ Statistica delle Cause delle Morti, etc., 1887.

presence of such visitors contributes to keeping up the disease in Italy is evident from the mortality returns of the towns and cities frequented by them. Pallanza, for example, had a death-rate from consumption and general tuberculosis in 1887 of 4.21 per 1000; Pisa, 3.25 per 1000; San Remo, 2.44 per 1000, and Spezzia, 2.35 per 1000.*

Now, what is the lesson to be learned from this vast reduction in the mortality from tuberculosis in Italy under the influence of the Neapolitan law? In the first place, it is a practical demonstration of the preventability of the disease; and secondly, it gives us some idea of what measures will bring about such a result. When side by side with the reduction in the mortality from tuberculosis in the kingdom of Naples under the operation of the Neapolitan law is placed the reduction which has taken place in England during the last forty years from the same disease, as the result of isolation in special hospitals, it can certainly no longer be said that the prevention of this disease is a mere theory. In England there has been a reduction of 50 per cent in the mortality from tuberculosis in forty years as the result of isolation of from three per cent to 18 per cent of all cases yearly.† In the kingdom of Naples the disease has been nearly exterminated in one hundred years by a system of isolation and disinfection, or, rather, destruction of infected objects. Either of these facts, standing by themselves, might be looked upon as mere coincidences, but taken together they must be accepted as the exponents of a fixed law. They show that tuberculosis is not only a preventable disease, but that it can be prevented by simple, easy methods. Now that we have real scientific knowledge of the etiology of tuberculosis and know something of the biology of the organism which produces the disease, we can understand how the empirical practices in Italy and the single preventive measure in England can have produced such astonishing results. We observe the law that no new case of tuberculosis can arise without having an old one to spring from, proven by the placing of old cases where they cannot produce new ones.

* *Supra cito.*

† Special Hospitals for the Treatment of Tuberculosis. L. F. Flick, *Times and Register*, March 15, 1890.

In the light of the history of tuberculosis in Italy and in England, is the sanitarian of the day fully cognizant of his power over this disease, and fully aroused to his duty in the matter of its prevention? If empirical methods could produce such results in Italy, and isolation on a comparatively small scale could produce such effects in England, what would be the result of well-regulated scientific methods for its prevention? It is my firm belief, after careful study of the question, that with our present knowledge of the etiology of the disease we have it in our power to completely wipe out the disease in a single generation. To do this would, of course, require well-organized boards of health, an enlightened public, and the co-operation of the entire medical profession. The prevention of disease is always nobler than its cure. Were half the energy which is being spent in the almost hopeless task of searching for a specific cure for tuberculosis devoted to its extermination, its accomplishment would be guaranteed. Why is nothing practical being done? The entire medical profession seems to have accepted the theory of the contagiousness of tuberculosis. Are we afraid to follow this theory to where it leads? If the disease is contagious it can be prevented. If it can be prevented, why are there not already practical measures in operation for its restriction? With the object lessons of Italy and England before us we can no longer remain inactive consistently with our convictions.

Inasmuch as we now know that the contagion of tuberculosis is confined to the sputa and pus, preventive measures are much simplified, as the only necessity is to render those substances innocuous. How should this be done? At the present stage of public enlightenment on the subject, the one measure which will accomplish the most good with the least friction with preconceived ideas is the establishment of special hospitals for the treatment of the disease. The voluntary withdrawal of patients to such institutions would remove centres of infection from the family hearthstone and would spread the doctrine of prevention, as well as practically educate the public to its methods. I believe, moreover, that the time has come when we should go further. Tuberculosis should be placed on the list of diseases returnable to the Board of Health, so that a record may be kept of the whereabouts of every case,

and of its movements from house to house. From a careful topographical study of the disease in the Fifth Ward of the city of Philadelphia,* extending over a period of twenty-five years, I am convinced that fully one half of the cases of tuberculosis among the poor people have their origin directly or indirectly in infected houses. A family unsuspectingly moves into a house which has just been vacated by a family in which a death has occurred from tuberculosis. In the course of time the weakest member of this family succumbs to the disease, and a new series of victims is started. The public certainly owes a duty to the individual in this matter, and that duty can only be exercised through the Board of Health. By keeping track of every case of tuberculosis, by showing the family of the unfortunate victim how to protect themselves against the disease, and by disinfecting every house which has been occupied by a consumptive before a new occupant moves into it, our boards of health could make themselves a most potent factor in the restriction of this fearful destroyer of human life.

I am aware that a great cry is being raised in advance against any practical preventive measures against this disease upon the plea of humanity. Why further burden the life of the poor consumptive, they say, by removing him from his family and friends, and emphasizing his hopeless situation? Sincere as the feelings may be which give rise to this conservative protest, it is evident that they are not inspired by a thorough understanding of the subject, such as can only be obtained by a bedside study of the question. What can be more inhuman than consigning an intelligent human being, with a long, tedious, loathsome disease, to the care of those whom he loves, when that care implies deprivation and death to them, and despair to himself! The classical symptom of consumption is hope and unbounded faith in ultimate recovery, and oh! what ingenious cruelty to make the poor victim feel that no helping hand is extended him, and that his chances for recovery are curtailed by the poverty of those who love him! The preventive measures for the restriction of tuberculosis, as dictated by the science of to-day, are all in direct line with humanity, and the strongest arguments which can be ad-

* Contagiousness of Phthisis. L. F. Flick, Transactions of Medical Society of State of Pennsylvania, 1888.

vanced for their adoption are born of the great command, "Love thy neighbor as thyself."

It is certainly humane to give the poor man who falls a victim to this disease a home in a hospital where he can receive all the aid of medical science for his recovery, and where he can feel that he is neither snatching from his dear ones the morsel of bread which is necessary for their sustenance, nor infecting them with the same horrible disease from the grasp of which he is trying to extricate himself. It is certainly humane to extend to the poor protection from a disease against which they have neither the knowledge nor means to protect themselves. Preventive measures against tuberculosis imply nothing more, and I trust this convention will not adjourn without taking some steps looking to concerted effort in this direction.

DETECTION AND ESTIMATION OF NITRATES IN WATERS.

—In 5 cc. of the water 2 centigrammes sodium salicylate are dissolved, and 10 cc. colorless concentrated sulphuric acid gradually added so as to form a distinct layer; by gentle shaking, the two layers are mixed, a pale yellow to deep red color indicating the presence of nitrates. This color is then compared with that obtained by using dilute potassium nitrate solution of known strength, allowing the tests to become cold before comparing. A standard solution of potassium nitrate is made by dissolving 1.870 gm. pure and dried salt in one litre; this contains 1 part N_2O_5 in 1000 parts; from this solutions are made containing 1 part N_2O_5 in 5000, 10,000, 20,000, 50,000 and 100,000 parts, respectively. These solutions are compared with the water to be examined. The limit of this test is one part N_2O_5 in 100,000 parts, indicated by a pale yellow color; these colors remain permanent for several days.—*G. Looff, Pharm. Centralhalle, 1890, 700.—American Journal of Pharmacy.*

THE FEDERAL DISTRICT IN THE REPUBLIC OF MEXICO AS A SUITABLE RESIDENCE FOR PERSONS PREDISPOSED TO TUBERCULOUS AFFECTIONS, AND FOR RELIEF OF PULMONARY CONSUMPTION.

READ AT THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, CHARLESTON, S. C., DECEMBER 16TH, 1890.

By DR. DOMINGO ORVANANOS, Member of the Superior Board of Health of Mexico.

THERE are in all countries over the world some places of a relative convenience, which may be considered as health resorts for persons affected with tuberculosis, principally of the lungs ; but few of them only are of an absolute advantage as real sanitaria, and these are to be found mainly on the high table-lands of both North and South America. Up to the present day no serious studies have been made with regard to these resorts in America, except by Dr. Denison respecting several places situated on the eastern slope of the Rocky Mountains, and by Drs. Jourdanet and Liceaga about several towns on the central table-land of the Republic of Mexico.

In this paper I intend to undertake the study, supported by recent data, of the advantages which can be obtained in the Federal District of the Mexican Republic for the establishment of sanitaria for persons predisposed to tuberculous affections or suffering from incipient pulmonary consumption.

The Federal District is a part of the political division of the Mexican territory, and is situated in its centre on the table-land of Anahuac, to the south of the Valley of Mexico, a part of which is formed by it, and at the height of between 2275 and 2900 metres above the sea-level, the most of its soil is at an average elevation of 2600 metres. It is situated between $0^{\circ} 10'$ longitude east and $0^{\circ} 10'$ longitude west of the meridian of Mexico, and between $19^{\circ} 11'$ and $19^{\circ} 31'$ latitude north. It is bounded northeast and west by the State of Mexico and south by the State of Morelos. It measures from north to south 39 kilometres, and from east to west 32, its surface being 1248 square kilometres.

Toward the southwest and south the Federal District is girt by huge mountains which form the chain of Las Cruces, Huitzilac and Cruz del Marques ; toward the west is a part of the mountains of Huisquilucan, which connect with those of Las Cruces toward the southeast and east by mountains of less elevation. With the exception of these heights and a few other mountains of less elevation, the whole district is flat. The ground is generally very fertile, the abundance of flowers is remarkable, and there is only a small part at the northeast, at the shores of the lake of Texcoco, where the ground is barren, owing to the efflorescence left by the salt waters of the lake as they evaporate. The City of Mexico is situated almost in the centre of the Federal District, though a little toward the north from the city, and everywhere in the Valley of Mexico is to be seen, in all its magnificence, the gorgeous volcano of Popocatepetl, the top of which is at 5400 metres above the sea level, and the beautiful snow-mountain Ixtaccihuatl of 4900 metres high.

All the mountains in the valleys are of volcanic origin, and formed mainly by large masses of porphyry. Ba-salt is found either in great currents, as those of the Pedregal de San Angel, or advancing into the valley on which it forms isolated eminences.

The soil of the valley is formed by the action of the atmosphere on the different varieties of porphyritic rocks modified by the influence of the lakes and marshes which have been expanding over different parts of the valley. The geological sections show that every layer is of marshy origin, alternating at different depths with currents and strata of subterraneous water, and resting on alluvial deposits.

As to the hydrography of the Valley of Mexico, we may consider it as divided into three basins : the first and the largest one is that of the north, which is separated from the others by the chain of mountains of Guadalupe and the hill of Chiconautla ; it contains at present three lakes, Zumpango, Xaltocan, and San Cristobal, the principal supplies of which are the rivers Cuauitlan, which leave the valley through the cut of Nochistongo, and that which is named Las Avenidas de Pachuca. The second basin is that on which the City of Mexico and the lake of Texcoco stand. It is separated from

the south basin by the hills of Chimalhuacan, Pino and Santa Catarina ; this basin is the lowest in the valley, and contains the lake of Texcoco, supplied by many little rivers which come down by the declivity of the Cruces at the west, and those of El Telapon and Tlaloc at the east. The third basin is that which contains the lakes of Chalco and Xochimilco. It forms the most fertile and picturesque region in the valley ; toward the east it is bound by the Popocatepetl and Ixtaccihuatl ; toward the south and west by the Ajusco and its dependencies, and toward the north by the hills above mentioned. The principal rivers these lakes receive are the Tlalmanalco and the Tenango, which arise chiefly from the melting of the ice on the volcanic mountains.

The synopsis of the principal meteorological elements, according to the observations made during twelve years (1877-88), are as follows :

Barometer, mean annual.....	586.42 mm.
" maximum	598.19
" minimum	579.80
Temperature, mean annual, shade.....	15.5° Celsius.
Maximum shade temperature.....	31.6°
Minimum shade...	1.7°
Maximum maximorum sun temperature.....	49.2°
Minimum minimorum " "	7.2°
Mean winter temperature.....	12.9°
" spring "	17.8°
" summer "	16.6°
" autumn "	13.5°
Maximum shade, oscillation in one day.....	22.3° (1887)
" in the sun " "	50.7° (1877)
Mean relative humidity.....	60°
Rainfall in winter.....	22.7 mm.
" spring	174.0
" summer	359.0
" autumn.....	63.5
Mean cloudiness.....	5.0
Prevailing wind.....	Northwest.
Mean annual ozone.....	4.4

We are now going to speak about the features of the climate

of the Valley of Mexico. As may be seen by the foregoing record, the mean temperature of the air in the Valley of Mexico is 15.5° in the shade. Looking for the difference between the month of April, which is the hottest, and December, which is the coldest month, we have found 7.5° —that is, the annual amplitude of temperature, which, as it is seen, is short enough. Accordingly, the climate of the Federal District can be classified as temperate and almost equable. In observing the variations of shade-temperature in the course of one month, we observe how remarkable the difference is between 25° in the shade and 52.9° in the sun. The variability of the climate of a country depends upon the difference of temperature from one day to another; our climate is essentially variable. The unsteadiness of a climate depends on the rapidity and extension of the hourly change of temperature, and in this respect our climate is almost unrivalled.

The daily oscillation has been 21.2° in the shade and 50.7° in the sun. All the changes of temperature are divided by the mean temperature between the annual mean from 18° below zero at 80° latitude, and the annual mean of 32° ; consequently, between these two extreme temperatures there is a scale of 50° ; so that we go through that scale in one single day, as it has been seen, and we can properly say that in one and the same day we experience all the changes, and it seems as if we were conveyed from the polar frozen regions to the burning zones of Africa.

This difference of temperature constitutes one of the characteristic features of our climate. In Mexico, with her dry atmosphere, the sun's rays produce an extraordinary heating power, so as to give our soil the appearance of being scorched. When the sun sinks behind the tops of the mountains, the radiation toward the heavenly regions in the Valley of Mexico begins; the air, which on account of its dryness is unable to prevent the heat from reaching the soil, is also unable to prevent its departing from it, and this takes place with extraordinary rapidity. We thus have in Mexico on one side the burning soil and on the other not only in the regions of great altitude, but in the moderate altitude of the valley, perpetual cold. In our region the eternal snow begins at an altitude of little more than four kilometres, as can be seen on the Popo-

catepetl and Ixtaccihuatl. The Valley of Mexico, as already said, is situated at 2300 metres above the sea level, and only about two kilometres distant from the eternal snow ; that is to say, as distant as a town would be that were situated at 50° or 60° latitude.

As the refrigeration of the atmosphere goes on, and, consequently, that of the vegetation also, the moment may come when the vapor of water in the open air and that which circulates in the plants is precipitated and congeals, and frost is the consequence.

Hoar-frosts are very frequent in our valley, on account of the dryness of the atmosphere, which contributes so much to radiation. The calmness of the air and the absence of clouds are powerful auxiliaries, but the lack of dampness in the air is, doubtless, the principal agent.

When freezing weather occurs in Mexico, a very remarkable phenomenon that takes place every day, and to which we are accustomed, but which constitutes a subject of astonishment to foreigners, is the great difference of temperature noticed between two places situated at a very short distance apart, the one exposed to the sun and the other in the shade. In the first we feel scorched because the diathermancy of the air allows the rays of the sun to pass through with their full power ; in the second we feel ourselves almost frozen because that diathermancy makes our body a powerful radiator of the heat which it has received.

The melting ice absorbs great quantities of heat, furnished in part by ourselves, and if by means of exercise we succeed in getting warm, after a little rest this warmth is absorbed by the atmosphere. This is the reason why in Mexico we often feel colder than we would in New York with half a yard depth of snow and ice on the ground.

As a consequence of this powerful radiation of the soil we observe in this region, where a perpetual spring reigns, that dew is very abundant at sunrise and at sunset, and then the flowers send forth their perfumes into the air.

The insolation of the valley is remarkable ; twice a year the sun passes the zenith, as it happens in all places situated between the tropics ; the greatest deviation of the rays of the sun when it is in the Tropic of Capricorn does not reach

44°. The longest day is thirteen hours and a half, and the shortest ten hours and a half. Most of the days are clear, and the transparency of the atmosphere is extraordinary ; this, and the remarkable dryness of the air, cause the rays of the sun to produce on the soil with the utmost intensity its luminous, calorific and chemical effects. These influences give birth to the remarkable purity of the atmosphere, which constitutes one of the principal advantages of our climate, which, besides being temperate and agreeable, makes it to a certain measure aseptic.

As a result, the number of deaths caused by several of the infectious diseases in the Federal District is proportionally less than in other countries. Diphtheria, imported a few years ago, has scarcely been able to establish itself ; scarlet-fever is rare ; small-pox, which in Europe and the United States sometimes attacks persons who have been once vaccinated, very seldom does so in Mexico ; yellow-fever is unknown on the central table-land, and tuberculous diseases, as will be seen presently, are commonly benign, scarce in many places, and quite unknown in other places.

The death-rate in the Federal District, however, ascends to a great percentage—to 40 per cent. This is mainly due to diarrhoea, small-pox, pneumonia, and typhus-fever, which diseases are caused respectively by the impurity of the drinking-water and improper food, half nakedness among the lower classes ; by intemperance, by want of laws to make vaccination compulsory, and by the absence in many houses of a good system of drainage and sanitary plumbing.

The Federal District is divided for its political administration into the Municipality of Mexico and the Prefectures of Tacubaya, Tlalpan, Xochimilco and Guadalupe-Hidalgo, in the whole twenty-two municipalities.

The population in the Federal District, according to last census, 1889, for the Prefectures, and 1890 for the Municipality of Mexico, is 440,644 souls.

Tuberculosis is very frequent in this part of the Republic of Mexico, situated between sea-level and 1000 metres above, in which 15 per cent of the general death-rate is caused by said disease, decreasing, however, from 1000 to 2000 metres altitude and still more from 2000 metres upward. The data of

the Federal District are comprised in the accompanying table.

TABLE SHOWING PERCENTAGE OF DEFUNCTS CAUSED BY TUBERCULOUS DISEASES OF EVERY DESCRIPTION, WITH REGARD TO THE GENERAL DEATH-RATE IN THE FEDERAL DISTRICT FROM JULY 1, 1885, TO JUNE 30, 1890.

MUNICIPALITIES.	Alt. above Sea Level, Miles.	Population.	Percentage of Natives.	Percentage of Foreigners and Strangers.	Total Amount.
Mexico.....	2,265.5	327,000	..	..	8.40

PREFECTURE OF TACUBAYA.

Tacubaya.....	2,305.5	12,027	3.11	2.40	5.51
Santa Fé.....	2,464.0	6,083	5.78	1.36	7.14
Cuajimalpa.....	2,905.0	7,018	1.70	0.56	2.26
Tacuba.....	2,297.4	3,188	1.88	0.73	2.61
Mixcoac.....	2,312.5	2,252	1.33	1.33	2.66

PREFECTURE OF TLALPAM.

Tlalpam.....	2,311.0	8,831	0.73	0.55	1.28
San Angel.....	2,317.0	10,580	1.41	0.80	2.21
Coyoacau.....	2,302.0	7,018	1.21	0.11	1.32
Ixtapalpam.....	2,303.0	5,825	1.01	1.07	2.08
Ixtacalco.....	2,303.0	3,127	1.01	1.07	2.08

PREFECTURE OF HOCHIMILCO.

Hochimilco	2,271.5	14,373	1.01	1.07	1.05
Milpa Alta.....	2,271.5	6,362	1.01	1.07	1.04
Hastahuacan.....	2,271.5	5,910	1.01	1.07	1.30
Tlahuac and Tlaltenco.....	2,271.5	5,271	1.01	1.07	1.20
Tulyehualco.....	2,271.5	3,776	1.01	1.07	2.57
Ostotepec.....	2,271.5	1,876	1.01	1.07	0.00
Atocpan.....	2,271.5	1,903	1.01	1.07	0.00
Mixquic.....	2,271.5	1,880	1.01	1.07	1.16

PREFECTURE OF GUADALUPE HIDALGO.

Guadalupe Hidalgo.....	2,240.0	6,566	2.23	1.68	3.91
Atzcapotzalco .....	.....	6,789	0.86	0.37	1.24

As may be seen by reference to the foregoing table, the deaths caused by tuberculous diseases are, with regard to the general death-rate in the municipality of Mexico, 8.40 per cent; in all the other municipalities the average is 2.07 per cent, with the exception of Tacubaya, which gives 5.51 per cent. In Xochimilco, with 14,000 inhabitants, the average is 0.94 per cent, and in Actopan and Ostotepec, of about 2000 inhabitants each, tuberculosis is well nigh unknown.

If we compare these data with those referring to some other countries, we may point out some very remarkable differences. For example, in England, Belgium, Italy, France, and Spain, tuberculosis causes almost 20 per cent of the general mortality;

in the United States, in the lowlands, 18 per cent, and in the mountainous regions, 6.47 per cent.

Comparing the mortality of tuberculosis of the cities of Mexico and Tacubaya with that of other centres of population in the Federal District, there is a great difference against those of the two mentioned, which is in accordance to an almost general law that the more populous a city is the more prevalent the tuberculous diseases. As to Xochimilco, where tuberculous diseases are nearly unknown, we believe that it might be attributed to its population chiefly of Indians, who, as it is known, are very resistent to tuberculosis ; and, on the other hand, to the circumstance that these places are not in close intercourse with other places in the District.

Be it as it may, the deduction can be made that the inhabitants of rural villages enjoy an almost absolute immunity from tuberculosis. But we cannot conclude from this deduction that these localities are suitable for preventing the development of and for curing tuberculosis. Some other circumstances, which will be considered presently, will enable us to form a more exact conclusion on this question.

In reference to the first point, whether the climate of the District is favorable for preventing the development of tuberculosis, though we have no exact statistics, we are justified in making the following reflections : First, there are in the District 165,000 inhabitants natives of other States of the Republic and 66,862 natives of foreign countries. In the majority of the States of the Republic, at from sea-level to 2000 metres above, tuberculosis occurs frequently in the sea-level regions ; and in the countries whence the foreigners come we have already seen that said disease occurs much more frequently. May we not believe, then, that many of those individuals import from their native lands the germ of tuberculosis, which has not been developed by reason of its not having found favorable circumstances in them ? May it not be supposed that those persons might be identified by degrees with all the climatological conditions of the place, and that many of them acquire the immunity allowed to natives ? Besides, it has long been known that, in these regions, when in a family one or several members have died of tuberculosis, the remaining members have to emigrate to the high regions of the Republic

to escape the terrible disease. As such emigrants often succeed in this, it is believed, and we think justly, that the *tierra fria* (cold land), as it is called in Mexico, is proper for the prevention of the development of tuberculosis in persons predisposed to it.

As to the question whether tuberculosis, once declared, can be cured in these regions, we can exhibit several facts in support of the affirmation of this question in reference to tubercles of the lungs.

These facts are : First, most of the 350 physicians of the Federal District refer to cases of pulmonary consumption cured in its first and second stages. Secondly, several of these physicians, as it happens with Dr. Licéaga, relate numerous cases of cure of this disease. Thirdly, it is not unfrequent to find at post-mortems made in the hospitals unmistakable traces in the lungs of tuberculosis perfectly cured. Fourthly, of our own experience, we have seen several foreigners, and many natives of the shores of our Republic who, on ascending to the Valley of Mexico, have succeeded in being cured of this disease. So that we cannot but believe that the climate of the Federal District is a suitable one for the cure of pulmonary tuberculosis in its first and second stages. How far this is generally true we cannot decide without having exact and extended statistics on the matter.

We have now to consider the causes which produce, in many places in the Valley of Mexico, an almost absolute immunity from tubercles in the lungs. During many years it was believed that the main cause of this immunity was the climate of these regions, which makes the application of the laws of hygiene easy and agreeable. Several mechanical theories subsequently found acceptance, among which one of the most commonly admitted was that residence in the highlands produced an enlargement of the chest, owing to the acceleration and amplitude of the respiratory movements. This enlargement is positive, but that it is not the cause of the immunity referred to has been shown by numerous experiments in Europe in ærotherapeutics, which never give the good results obtainable by prolonged residence in the altitudes.

Later it was believed (Dr. Jourdanet), in Europe principally, that *anoxyhemia*, or lack of oxygen in the blood, was

the principal agent. But this anoxyhemia has not been demonstrated, and it has not been explained how the scarcity of consumption can be due to it ; so we ought not to take that into consideration.

The micro-biological doctrines, and especially the latest experiments of Koch, furnish, according to our judgment, data enough for the researches with which we are dealing. It has been discovered that, of the natural conditions which prevent the origin and development of Koch's bacilli, there are three —namely, cold, dryness, and sunlight. As to the first, it is known that a temperature below zero destroys them entirely, and it is a long-known fact that the limit of altitude where immunity from consumption begins is an altitude approximating the climate of the polar regions, at an elevation parallel to the line of eternal snow, insomuch that consumption disappears at an altitude of 4000 metres under the equator, and that it is not found, even at the sea-level, in the frozen latitudes, as, for instance, in Iceland. The surface-temperature of the soil in the Valley of Mexico very often goes down to zero, which is easily understood, considering that frosts are common during the whole year, and such descending of temperature must necessarily destroy many classes of microbes, and the bacillus of Koch among them.

Microbes can only live and develop in a moist medium. In our country fog is almost unknown ; the surface of the soil is quite dry on account of rapid evaporation, due to rarefaction of the air, to its movement, and particularly to its lack of relative humidity.

But light, above all other conditions, is one of the most important agents in the destruction of microbes. Koch's experiments show that under the direct influence of the sunbeams death of the bacillus takes place within a lapse of time varying from a few minutes to a few hours, so that even diffused daylight acts in a similar manner, though slower, since culture of bacilli exposed in a window always perish at the end of six or seven days.

In the Valley of Mexico the luminous, calorific, and chemical intensity of the sun's rays is extraordinary, the diffused light also being very remarkable, and all this undoubtedly contributes, in the first place, to the scarceness of phthisis.

Besides cold, dryness of the atmosphere and intensity of light, we believe there is another circumstance that may in a certain measure contribute to both the scarceness of the disease in these regions and the healing of incipient tubercles in the lungs ; we allude to the noticeable exhalation of the odor of flowers, which, as we have already stated, is remarkably abundant in almost the whole district. According to several experiments of Koch, the essential oils, even in small quantities, kill the bacilli, or at least prevent their development, rendering them harmless to man. May not the air so highly aromatized, chiefly at sunrise and sunset, be another of the agents that destroy these bacilli both inside and outside of the organism ? Though experiments thus far are unfavorable as to the action of these scents on the bacilli contained within the lungs, the same experiments have been favorable on pure cultures of microbes, owing to several circumstances unknown to us that have perhaps prevented good success in said experiments in man.

THE HEALTH OF THE NAVY.

ABSTRACT OF THE REPORT OF SURGEON-GENERAL, CHIEF OF THE BUREAU OF MEDICINE AND SURGERY, U. S. NAVY, FOR THE YEAR 1889.

THE hospitals, dispensaries, surgeon's quarters, equipments, etc., are, in general, in good condition. Some of the hospitals, dispensaries, and quarters have been extensively repaired and improved, and better equipped.

The Naval Hospital, at Brooklyn, in particular, has been provided with an antiseptic operating room, the drainage thoroughly overhauled and, for the most part, renewed ; steam-heating apparatus also renewed, and the surroundings improved.

The Museum of Hygiene, under the charge of Medical Director Wales, with whom, as Surgeon-General, it originated, shows continuously increasing evidence of its necessity and usefulness, and by its growth and work a greater appreciation of its value is given. In the bacteriological and microscopical

departments, diseased tissues and morbid products have been examined and opinions given ; there was an increase of 113 analyses over last year, consisting in part of mineral and potable waters, air, proprietary medicines, fluid extracts, tinctures, wall-paper for arsenic, concentrated foods, soaps, paints, etc.; certain investigations have been made and are still in progress.

The laboratory has been greatly improved by an increased supply of gas, and the completion of the furnace and combustion room. It is now capable of undertaking analyses for any bureau in the Navy.

The library has slowly increased ; 118 new books have been added, a want of funds having prevented a larger growth. A catalogue of the library is needed, and a sum is desired for that purpose.

The exhibits have been rearranged, adding to their accessibility and appearance, and giving room for others ; 26 specimens have been added, illustrating sanitary science.

The increase in the number of visitors, and the inquiries made by medical men, architects, builders, and manufacturers are sure indications of the growing appreciation on the part of the public.

An endeavor is being made to complete the sanitary history of each State, with expectations for its realization. The impediment to the more rapid growth of the museum is deficiency in money and in workers to do the work that should be accomplished each year ; until those two defects are remedied its growth will be slow.

Vacancies in the Medical Corps continue to be a burden, which has existed ever since the termination of the Civil War ; and there appears to be no prospect of its removal until such improvements in the rank and pay of assistant surgeons are provided by law as to induce worthy candidates to fill them. In addition to 8 vacancies in October, 1889, 5 occurred subsequently during the year, 2 by death, 2 by retirement, and 1 by resignation. Nine have entered the service, still leaving 4 vacancies.

The number of persons examined for the naval service, including apprentice boys, during the year 1889, was 13,444 ; of this number, 4896, or more than one-third, were rejected for phys-

ical disqualifications. The number of these rejected for color-blindness was 176, a ratio of 13 + in 1000.

The number of patients admitted to the sick list and under treatment during the year was 12,029; of this number 8102 were on vessels afloat and receiving ships, 1595 in hospitals, and 2332 at navy yards and shore stations.

The daily average of sick on vessels afloat was 165.31. The average each case was under treatment represented a loss of 7.44 days; 93.94 in 1000 were invalidated to hospitals, and 9.89 in 1000 died.

The total number of deaths in the naval service during the year was 203; of this number 111 occurred on vessels afloat and receiving-ships, 70 at naval hospitals, and 22 at navy yards and shore stations. The ratio was 18 + in 1000 for the entire service.

Insane.—There were 91 patients belonging to the Navy treated in the Government Hospital for the Insane in the District of Columbia for the year ended September 30th, 1890. Remaining in hospital September 30th, 1889, 66; admitted during the year ending September 30th, 1890, 25; total under treatment, 91. Discharged during the year: Recovered, 9; improved, 5; died, 12; on visit, 1—27. Remaining in hospital September 30th, 1890: Officers, 7; enlisted men, 57—64.

Naval Hospital Fund.—The condition of this fund is as follows—viz.: Balance on hand October 1st, 1889, \$208,989.48; transferred to the credit since October 1st, 1889, \$70,377.05; credit by appropriation, act June 30th, 1890, \$20,000—\$299,366.53. Expended since October 1st, 1889, \$84,424.57. Balance on hand October 1st, 1890, \$214,941.96.

Special Reports.—Naval Hospital, Brooklyn. Medical Director Albert L. Gihon, after giving an account of the improvements in detail, reports the complete ward capacity of the hospital, 125 beds.

The average cubic air-space for patients in the wards as at present equipped is a little over 1200 cubic feet per man, and in sick officers' rooms from two to five times that amount. The spacious attics, which have been vacated and cleaned, can furnish in emergencies comfortable accommodations for an indefinite number of convalescents, venereal cases, and others of comparatively trivial character.

During the year ended, 532 cases have been under treatment, of which 381, or 71.6 per cent., were discharged to duty; 34, or 6.3 per cent., were discharged from service by expiration of enlistment or by recommendation of boards of medical survey; 26, or 4.9 per cent., were transferred to the Government Hospital for the Insane at Washington, the Naval Home at Philadelphia, or to other naval hospitals, at the request of patients desiring to be near their own homes, and 23, or 4.3 per cent., died.

The mortality rate, 43 per 1000 cases, is somewhat less than the average proportion of deaths to cases for all the naval hospitals for the sixteen years from 1873 to 1888, inclusive, during which period out of 18,505 cases treated, 854 died, a ratio of 46 per 1000.

Naval Hospital, Philadelphia, Medical Director A. C. Gorgas in charge, reports: The average number of beneficiaries at the Home during the year was about 200. Of these there were 154 under treatment for disease and admitted as patients into the hospital; there were 76 patients also from the general naval service, making the whole number 230, which included 19 continued from the preceding year. During the year there were 21 deaths.

The medical history of the year shows a wholesome state of things at the Naval Home. The deaths among the old men have been from causes incident to advancing years, to accident, and to imprudence; there have been no "preventable" diseases, and there has been a remarkable immunity from acute disorders.

Naval Hospital, Norfolk, Va., Medical Director C. J. Cleborne in charge, reports: One hundred and seventy-nine patients were treated during the year, of which number 33 were continued from 1888 and 146 were admitted, leaving 35 under treatment in December, 1889. Twenty-one cases were invalided from the service, 14 were transferred to other hospitals, 4 died, and 105 were returned to duty.

There were 9899 "sick days," of which 2204 were venereal. The daily average number of patients was $27\frac{44}{65}$. Average duration of treatment, $55\frac{54}{179}$. Average cost per patient (including repairs and all expenses of hospital), \$1.71. Daily average cost for subsistence per man $25\frac{37\frac{9}{16}}{18\frac{1}{2}}$ cents.

The Influenza at Sea.—Medical Inspector T. C. Walton, U. S. Flag-ship Chicago, reports : The ship arrived at Lisbon December 21st from a voyage across the Atlantic. “La grippe” was prevailing in Lisbon at the time and had been for about ten days. It was said to have been brought from Paris by a family arriving from there and to have spread from that family. About six hundred cases had occurred at the time of our arrival, and the number was daily increasing. It was not thought advisable to quarantine the ship against the city, as the disease was considered to be more epidemic than contagious, and that quarantine would be inefficient so long as the ship remained in the harbor.

On December 23d, about thirty-six hours after having been on shore in Lisbon, an officer was seized with a chill, followed by fever and other well-marked symptoms of influenza (*catarrhus epidemicus*). On the 25th two other cases reported, the first symptoms being noticed about twenty-four hours after they returned from shore. On the 26th another case reported, on the 28th four cases, on the 29th four cases, and on the 30th six cases, one of whom had not been out of the ship since our arrival in port ; all of the others had visited Lisbon. On the 31st several persons were attacked who had not been on shore, and from that date cases occurred indiscriminately. The men of the engineer force, who were berthed on the lower decks, for a time enjoyed an immunity ; later many of their berths were changed to the gun deck, and the immunity among them soon disappeared. It was noticed that after the prevalence of a high wind (direction variable), which circulated freely through the upper decks of the ship, the number of cases occurring daily rapidly increased. Altogether 162 cases were treated ; 118 of them appear on the sick-list ; many others on board had the disease, but in so mild a form as not to necessitate their applying for treatment. It is believed that at least 60 per cent of the ship’s company were affected. There were thirteen cases of relapse.

From Lisbon the ship went to Tangier, Morocco, arriving off there January 2d. Pratique was refused on account of the prevalence of the disease on board, though a clean bill of health from Lisbon, with the visé of the Moorish consul attached, was presented. Influenza had not at that time appeared in Tan-

gier ; it was reported to have done so about two weeks later, and in Morocco, the capital, earlier than in Tangier.

January 5th the ship arrived in the harbor of Gibraltar and was granted pratique, on condition that those infected should be kept isolated and on no condition be allowed to land. This was observed, the sick-bay and berth-deck being apportioned to the sick. About forty cases of the disease were reported on the Rock at the time of our arrival, and before our departure, January 15th, it had extended over both civil and military parts of the fortress, as well as on board many, if not all, of the vessels in the harbor. It was observed that men from the British ships of war were on shore daily with catarrhal symptoms that would have caused them to be quarantined had they been on board of our vessels.

On our arrival at Cartagena, Spain, January 17th, there was no hesitation about granting pratique, nor at Port Mahon, Minorca, the next port visited. The epidemic was at its height in both those places during our stay at them ; general liberty was given the crew without a single recurrence of the disease. The last case reported for treatment January 21st. The chief characteristics and peculiarities of the disease have already been described in replies to the series of questions sent out by the Bureau.

The immunity enjoyed by the coal-heavers and for some time by other members of the engineer force was no doubt due to their sleeping on the lower decks, where the air circulation was limited and but few of the crew were billeted as among those who were removed to the gun-deck. In order that the berth-deck might be used for purposes of isolation the immunity ceased.

No deaths occurred, and at this writing, with one or two exceptions, no trace of the epidemic remains.

Our experience leads to the belief that the disease is contagious, is transmitted through and by means of the atmosphere, and has a period of incubation of from twenty-four to forty-eight hours.

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

CONTRACTION—RÉTRÉCISSEMENT—or closing of the ileo-cœcal valve and its treatment, has engaged the serious attention of M. Péan. The contractions of these valves are neoplastic or inflammatory.

Some surgeons have been satisfied with forming an anus *contre nature* above the constriction ; others have practised digital expansion, or stretching, or they resect the cœcum and unite the ileum to the small intestine with the suture. M. Péan thinks it is possible to save the patient from a condition so repulsive as an anus *contre nature*.

As reported by the *Gazette Hebdomadaire*, he says the resection of the intestine is very difficult ; in the ileo-cœcal region it is tedious and dangerous, and the patient may die of collapse ; it is the only rational means to be employed in neoplastic constriction. M. Péan has devised a method of operating applicable only to inflammatory cases ; he does not resect the intestines ; he makes an expansion at the point where the constriction was found. He describes his operation as follows :

Four centimetres above the fold of the groin, parallel with the ligament of Fallapius, the skin and the subcutaneous cellular tissue are divided from the antero superior spine of the ileum to above the spine of the pubis. The aponeuroses and the muscles are divided for an extent somewhat less, and the wall of the peritoneum for about four centimetres. In this way the cœcum is easily reached, and also the lower part of the small intestine. During this procedure artery forceps are applied to the bleeding vessels, and aseptic compresses are so placed as to prevent all liquids from entering the peritoneal cavity.

So soon as the ileo-cœcal valve is reached the adjoining portions of the cœcum and the ileum are drawn up and are ligated above and below with two rubber tubes, passed with the aid

of a forceps beneath the mesenteric portion of the ileum and the cœcum to a distance of about eight centimetres from the valve. While the loops of these bands firmly close the intestines their free extremities, instead of being tied, are held firmly with blunt forceps. These bands serve the double purpose of preventing profuse bleeding and of hindering all fecal matter from entering the part thus separated during the time of the operation.

These precautions taken, the intestines are incised over and on each side of the valve, the entire length of the incision being eight centimetres. Then, having washed the internal surface of the intestine with a solution of phenic acid one per cent, the surgeon is enabled to judge of the exact condition of the valve. It is found that it has been changed into a fibrous tissue, and that the surface is covered with fleshy growths resembling pimples, which close the passage. These, as well as the mucus, are removed to the level of the muscular coat. This done, the two edges of the wound are brought together with the forceps so that the iliacal and the cœcal surfaces touch and lie surface to surface—*s'adossent*. By being joined in this way the incision of the intestine, which was made longitudinally, takes at first the form of a lozenge, two sides of which are formed with the lips of the small intestine, and the other two with those of the large intestine before becoming transverse. Then the opposite edges of the intestines are united one to the other with sutures, so as to form a complete occlusion. The sutures are formed in two sections by means of loops placed very close together. The loops in the deep folds are of catgut; they join the mucous and the adjoining muscular tissue. The superficial ones are of silk sterilized; they join the serous and the external portion of the muscular layer. The ends are tied and cut level with the surface. The superficial parts are closed, so that the edges of the intestine are turned a little inward and brought back to back—*en s'adosant à elles-mêmes*.

The sutures being completed, the rubber ligatures are removed. Immediately the blood is seen to resume its course in the vessels, and the fecal matter passes from the superior portion of the intestine through the new passage to the rectum with incredible rapidity. If at this stage the patient

makes an effort to vomit it may happen that a suture is found wanting. In such case the operator immediately washes the part soiled with a solution of sublimate, one part to one thousand, and then closes the small opening with silk sutures, both deep and superficial.

When the intestine is replaced it is well to dust it with iodoform and to fasten it with a suture to the wall of the peritoneum. The abdominal wound is then closed in the usual way and covered with a dressing of iodoform gauze, with sublimate and prepared cotton as a compress.

Two patients operated on in this way were radically cured.

The recovery was rapid, and the operation was not followed by any complication.

Cow-Pox.—Some results of recent experiments communicated to the Biological Society by MM. Straus, Chambon and Ménard, according to the *Gazette Hebdomadaire*, showed that inoculation into the veins, and also those made into the anterior chamber of the eye, gave full immunity against the disease.

The injection of vaccine lymph into the veins gave full protection.

The transfusion of the blood of an animal having cow-pox, when the eruption is at its height, will not afford protection, unless a large quantity be transfused.

The transfusion of the blood of an animal that has been vaccinated for a considerable length of time before transfusion will not give any protection.

Lymph that has been filtered has no value whatever as a protection against small-pox.

THE RATIONALE OF INFLUENZA.—The following remarks by Dr. Laffont, Professeur de Thérapeutique à la Faculté de Médecine de Lille, from a recent number of the *Medical Press and Circular*, will be read with interest: "The epidemic which was such a cruel scourge last winter is again appearing, although up to the present in a milder form. It may, therefore, not be without use to consider at the present moment the most rational treatment of this affection, at all times painful, and sometimes, from its complications, serious. This

malady is, I consider, a contagious catarrhal affection, in its milder form known to us as 'grippe,' but from its recent serious epidemic character christened 'influenza,' a name it will probably retain henceforth. The symptoms of this complaint are manifested invariably by a functional depression, more or less marked, of the whole system, varying from simple lassitude, stuffiness of the nose and slight gastric obstruction, all premonitory symptoms of a large number of contagious diseases, and fortunately often constituting the only symptoms of the malady, which in such cases passes for ordinary 'grippe.'

"In the late epidemic, to these premonitory symptoms succeeded all the characteristics of grave typhoid infection : nausea, fever, muscular pains, delirium, pneumonia, with tendency to suffocation and complete prostration. In the discussions at societies and in medical journals on its etiology, some described it as a simple catarrhal affection, more or less grave, having for cause the influence of the external conditions of the atmosphere, and denied its contagious character ; others sought at once for the microbe. In the midst of these etiological discussions, no therapeutic law was propounded, and the medical journals were advocating here aperient medicine, antithermics ; there, the Vin Mariani (made from the coca of Peru) and tonic medicines ; elsewhere, counter-irritation and balsamics were said to do wonders ; almost everywhere was admitted the specific effect of sulphate of quinine, or still better salts of quinine, above all, antipyrin. From my own experience, based upon a great number of cases and on myself in particular, I have no hesitation to assert that the method which succeeded the best was essentially eclectic. Thus, at its first manifestation I was able to arrest the development of the disease by administering an aperient (*oleum ricini* by preference), then causing thoracic revulsion by rubefaction, or even vesication, and by provoking simultaneously a non-depressing diaphoresis, easily obtained by administering several times in the day a grog made from *Vin Mariani*, one-third wine and two-thirds water, very hot, with sugar, such as has been prescribed by the learned laryngologist Fauvel for hoarseness and loss of voice, 'a frigore.'

"In the presence of influenza in the stage when the patient was completely depressed, very far from ordering antipyrin,

which only augments the depression, I found it much more effectual to administer strong tonics, such as generous wines, champagne, whiskey, rum, cognac, tonics physical and moral, such as the preparations of coca Mariani, vin and elixir, at the same time causing revulsion, and administering repeated aperients. From this treatment I rapidly cured myself, and observed the same results in patients without that long and tedious convalescence due, as I think, to the weakness caused by the use of antipyrin.

"I advise, then, as a rational treatment for influenza and kindred affections : first, gentle purgatives ; second, diaphoretics and revulsives ; third, strong tonics."

APERIENT LIQUORS.—The injury caused by the use of aperient liquors, wines containing artemisia, bitters, absinth, and the like, has, according to the *Gazette Hebdomadaire*, been described to the Academy of Medicine by M. Lanceraux.

The liquors or cordials containing these essences are, he says, far more injurious than alcohol. Their effects are shown by the disturbance produced in the nervous system ; by the perversion of sensation and motion in the nerves of the lower extremities. Their action on the intelligence is always bad and, what is even more serious, they frequently produce pulmonary consumption in the unfortunate sufferer. It is very desirable that the public be made acquainted with the dangers resulting from the use of these liquors, and M. Laborde suggested that frequent conferences be held on the subject and observations be made as to their use. M. Lanceraux suggested that a special tax be imposed on all aperients of that class.

If they are as dangerous as described, why not prohibit their manufacture and sale ? A special tax will not remedy the evil, because the price as compared with the cost of production is so great that the proprietors could afford to pay a heavy tax and still net a large profit. What is said of these liquors is equally true of many of the patent nostrums sold in this country.

TRANSACTIONS OF THE SEVENTH ANNUAL
MEETING OF THE AMERICAN CLIMATOLOGI-
CAL ASSOCIATION, HELD AT DENVER, COL.,
SEPTEMBER 2, 3 AND 4, 1890.

TREATMENT OF PULMONARY CONSUMPTION
BY RESIDENCE IN COLORADO AS EXEMPLI-
FIED BY THE ANALYSIS OF 141 CASES.

By S. EDWIN SOLLY, M.D., M.R.C.S., England; of Colorado Springs.

LAST summer, while in London, I had a conversation with Dr. Theodore Williams. He referred to his report of 141 cases of phthisis treated in the Alps. For the purpose of comparison, I decided to take the same number of cases in presenting my report to you of those treated in Colorado. Dr. Williams has carried his cases up to the time of making his report, and thus some of the later cases have been too short a time under observation to make them of value as regards the general results, and naturally tend to make them more favorable than they might have been had he allowed two years to have elapsed, as I have done, between his last case and his report.

I have taken my cases as they happened to come, only selecting them in so far as I rejected those in which the notes were not sufficiently complete, or concerning whose present condition or death I could not procure reliable information. They are not arranged in the order of the date of their first examination, but were added to the table as the final information concerning them was procured. As soon as the required number, 141, was obtained, my report of cases stopped. They are scattered through my practice during the first fourteen years my residence in Colorado, and thus, without giving the entire results of my experience of the treatment of phthisis during that period, give a very fair sample of it.

Dr. Solly then spoke of the chief points of his paper and statistics and their comparison with those of others, quoting some cases in illustration, and then proceeded:

I have taken the number 141 as the limit of my report of cases, in order to make the comparison as exact as possible

with the 141 cases reported on by Dr. Theodore Williams, of London, in May, 1888, which were all treated, with the exception of four, in Alpine resorts. All the cases which I report were treated in Colorado Springs, though in a few instances, a portion of the period of residence was spent in other parts of Colorado or in New Mexico, in similar climates and high elevations. In many there were absences of a month or more at a time during convalescence which have not been deducted. The cases were all under my observation and treatment more or less continuously during the periods covered by the histories herewith outlined. They have been selected only so far as I took those whose history, from the time of the first visit to the present, was sufficiently complete to make them thoroughly authentic. As many have left Colorado and are widely scattered, it was only possible to gain reliable information concerning their present condition of a portion of those treated. When a case was thus complete it was added to the list without regard to the order of date, and when the desired number of 141 was reached the reports were closed. The period over which the observations extend is the past sixteen years, the time of my residence in Colorado Springs. No cases are reported on whose first visit dates more recently than two years ago, thus allowing time to confirm the reports, and in most of them the first visits were paid at much longer distances of time. Although these reports do not give a continuous record of my observation of cases during the past sixteen years, yet taken as they are at random with respect to results, I believe them to represent very fairly my experience during that period. The comparison with the reports of Dr. Denison* and of Dr. Fisk,† both of Denver, as well as with those of Dr. Williams, show so close a resemblance in percentages and results as to confirm this belief. I have followed Dr. Williams' methods of classification and statistics very closely, as I believe they are as good as can be used, and have only varied from them in a few instances, and have not followed him in his analysis of local results through lack of time. In the tables of cases I have limited myself, as

* *Rocky Mountain Health Resorts.* By Charles Denison, M.D. Houghton, Mifflin & Co.

† President's Address to Colorado State Society, 1888. By Dr. Samuel Fisk.

far as possible, to practical conclusions, not the reasons for reaching them, which the original notes alone would show. I have also omitted many of the minor points, so as to make the tables less complicated for reference. The headings under which the cases will be found in the tables appended to this paper are the same as Dr. Williams'—viz., sex, age, date of first visit,* length of illness previous to commencing residence, family predisposition, haemoptysis, length of residence. Then, under the general heading of result, are placed general result, weight, local result, chest circumference, and lastly notes, under the heading general result. The results are grouped under five terms—cured, greatly improved, improved, worse, died. Those cases which were pronounced cured were those in which all symptoms, both local and general, had disappeared, and who were, at or near the time of making the report, still in good health. Of these several had returned to their homes, and in all intervals of from two to fifteen years had elapsed since the cure. The greatly improved are those who were apparently perfectly recovered except for some remaining evidence of past disease in the lungs, or slight partial disability in general health. The improved are those in whom the disease was in a state of arrest, in whom the tendency toward death was apparently averted, in whom there might have been some advance of disease since coming, and in whom there were still some local or general evidence of disease, but of whom it was fair to say that they were improved by their residence in Colorado. The number grouped under the heading worse are few, as in most cases the time that had elapsed had allowed for their termination in death. Under the head of died are put those who died either in Colorado or elsewhere from the disease; two cases who improved died later, one of syphilis and one of rheumatic endocarditis, are therefore not recorded under this heading.

Sex.—The patients were 106 males and 35 females, belonging to all conditions of life, though none in actual want or pov-

* Nature and extent of disease on commencing residence in Colorado, which was usually nearly the same date as first visit. Where the first visit was not paid till some time after residence was commenced, I have, where possible to obtain the information, given the condition on first commencing residence under the head of first visit.

erty. Dr. Williams's were all of the wealthier classes only. Their ages at the time of commencing high altitude treatment are shown in Table I. The average age for males was 30.7 years; females, 23.

TABLE I. SHOWING AGES OF 141 PATIENTS WHEN THEY BEGAN TO RESIDE IN COLORADO.

	Males.		Females.		Total.	
	No.	Percentage.	No.	Percentage.	No.	Percentage.
10 to 20 years.....	8	7.54	4	11.42	12	8.51
20 " 30 "	53	50.00	16	45.71	69	48.20
30 " 40 "	34	32.07	14	40.00	48	34.00
40 " 50 "	11	10.37	1	2.85	12	8.51
Total	106	....	35	..	141	..

The greatest number were between 20 and 30 years of age, being 48.2 per cent. Dr. Williams's were 56.02 per cent; Dr. Fisk's, 53 per cent; Dr. Denison's, 47.2. Between 30 and 40 there were 14 per cent more than in Dr. Williams's cases, and Drs. Denison's and Fisk's were also more. As in Dr. Williams's, and most statistics, the percentage of females attacked before 20 years of age was higher than the males, and reversed between 20 and 30. Between 30 and 40 the percentage of females was higher again in my tables, while lower in Dr. Williams's.

The average age for males was 30.7, as against 27.27 (Williams), and females, 23, against 24.46 (Williams), showing that in Colorado the men were generally older and the women younger than in the Alps.

Date of first visit.—This was usually within a week or so of arrival.

Length of illness.—This is the period that elapsed between the first symptoms appearing and the patient's arrival in Colorado, which was in most but not all cases near the time of first visit.

Between 1 and 6 months.....	20	The average length of illness was for both sexes 2 years 8.6 months, nearly 2½ years before coming.
" 6 months and 1 year.....	32	
" 1 and 2 years.....	44	
" 2 " 3 "	17	
" 3 " 4 "	8	
" 4 " 5 "	6	
" 5 " 15 "	14	

The average length of illness for males was 32.04 months; for females, 23.91 months. This shows the average of cases were much more advanced when coming to Colorado than when going to the Alps, as the averages given by Dr. Williams are 24 months for males and 19.31 months for females. Dr. Denison's average for both sexes was 22 months—that is, three quarters of a year less than mine.

Family predisposition was found in 82 (62 males and 20 females), being present, therefore, in 58.1 per cent of the 141 patients, as against 44 per cent only of Dr. Williams's cases. Dr. Denison shows 51 per cent; Dr. Fisk, 52 per cent; mine showing 56.6 per cent in males and 57.14 per cent in females, with Dr. Williams's 32 per cent in males and 73 per cent in females. Both these show the stronger influence of heredity among females, as pointed out by Williams. In my total number of hereditary cases 70.73 per cent improved; in Dr. Fisk's, 73 per cent improved.

This shows, in both Dr. Fisk's and my own, a little higher percentage of improvement among hereditary than among non-hereditary cases, which is perhaps explained by the earlier resort to treatment by climate and the greater care afterward. The belief among most of the laity that consumption is necessarily hereditary has undoubtedly led many of the non-hereditary cases to be slower to take care of themselves.

Hæmoptysis occurred to a greater or less extent in 78 cases, being 55.31 per cent. Seventeen had a recurrence after coming to Colorado, being 12.76 per cent of the whole 141, or 21.79 per cent of the 78 cases. Of the 78 cases, 20 were cured, 17 greatly improved, 13 improved, making 50 benefited, being of the 78 cases 64.1 per cent benefited. Twenty-six died and 2 deteriorated, making 28 worse, or of the 78 33.3 per cent deteriorated. The total per cent of cases with hæmoptysis, 55.31 per cent, is close to Dr. Williams's average for 1000 cases, which was 57 per cent. In the 141 cases he recently reported the average was only 43.76 per cent.

Pyrexia was found in the afternoons of the first week of arrival to a greater or less extent in 80 cases, 56.73 per cent of the 141. Of these 40 per cent got worse, which is above the average of worse for the whole 141, that being 32.62 per cent. Dr. Williams refers to only 10 of his cases having fever about

the time of the first visit. That his examinations were made, I presume, at sea-level, and mine at 6000 feet elevation, soon after a fatiguing journey up to it, may account in part for the difference, and the rest perhaps may be explained by the more advanced character of most of my cases.

History and nature of cases.—Five had pigeon breast, 2 syphilis, 3 heart displaced, 3 marked dilatation, besides several in which there were symptoms of an undecided or transient dilatation, 1 old mitral regurgitation, 1 asthma, 20 cases of tuberculosis, besides pulmonary—viz., 3 anal fistulæ, 2 hip disease, 2 aural disease, 2 testicle disease, 2 kidney (lardedaceous) disease, 2 cervical glandular disease, 7 laryngeal (unmistakably tuberculous), and besides these 13 had marked symptoms of laryngeal congestion, with more or less aphonia, which in several suspiciously suggested early tubercular deposit.

Of the 7 undoubted cases of tubercular laryngitis, 2 im-

TABLE II.

Stage.	Number.	Per cent.	State of Lungs before Residence in Colorado.						Total.
				Cured.	G. Improved.	Improved.	Worse.	Death.	
1st	62	43.97	25 had right lung alone affected..... 21 had left lung alone affected..... 16 had both lungs affected	13	7	3	..	2	25
				15	3	..	..	3	21
				8	4	1	1	2	16
2d and 3d	79	56.02	30 had right lung alone in 2d and 3d stages..... 5 had right lung in 2d and 3d stages and the left in 1st stage..... 28 had left lung alone in 2d and 3d stages..... 9 had left lung in 2d and 3d and right in 1st stage..... 7 had both lungs in 2d and 3d stages.....	36	14	4	1	7	62
				8	6	6	1	9	30
				..	1	..	..	4	5
				2	5	8	..	13	28
				..	2	1	..	6	9
				1	..	1	1	4	7
				Totals.....					141
				47	28	20	3	43	

Stage.	Number.	Per cent.	State of Lungs in 2d and 3d Stages, Separate.						Total.
				Cured.	G. Improved.	Improved.	Worse.	Death.	
3d	30	21.27	13 had the right lung alone affected..... 14 had the left lung alone affected..... 3 had both lungs affected.....	1	3	3	..	6	13
				..	5	1	..	8	14
				..	..	1	..	2	3
2d	49	34.75	22 had the right lung alone affected..... 22 had the left lung alone affected..... 5 had both lungs affected.....	1	8	5	..	16	30
				7	4	3	1	7	22
				2	2	8	..	10	22
				1	..	..	1	3	5
				10	6	11	2	20	49

proved and 5 died, giving improved, 28.57 per cent. Of the 13 dubious and the simple chronic laryngeal cases, the improved were 61.53 per cent. Of the 7 tuberculous, in all but 1 there was more or less improvement and healing of ulcers for a time at the first, and in some the ulcers remained healed till the last few weeks.

State of the lungs.—Table II., which precedes, gives the principal facts. Of the 141 patients, 43.97 per cent were in the first stage, or that of tuberculization, and 56.02 per cent in the second and third stages, or those of softening and excavation (of these 34.75 per cent were in the second and 21.27 per cent in the third stage). Dr. Williams's 141 cases show more in the first stage—viz., 64½ per cent, and in the second and third combined, 35½ per cent.

In 23 of the 141 patients both lungs were affected—*i.e.*, 16.3 per cent.

In 118, or 83.68 per cent, one lung was attacked—the right in 60, or 42.55 per cent, and the left in 58, or 41.13 per cent. One lung was affected in 83.68 per cent; in Dr. Williams's, 62 per cent. The right in 42.55 per cent; Williams's, 35½ per cent. The left in 41.13 per cent; Williams's, 27 per cent. Both lungs were affected in 16.3 per cent; Williams's, 37½ per cent—a very much higher percentage. In the first stage one lung was affected in 74.35 as against Williams's $\frac{2}{3}$ in $\frac{3}{4}$ months, Both lungs in 25.8, or a fourth; Williams's in one third. The right was alone attacked in 25 and the left in 21, as against 37 and 23, both confirming Dr. Williams's previous conclusion that the right lung is the most liable to tuberculosis.

Of the 62 cases in the first stage 16 had signs of tuberculization at only one apex, all of whom improved. While 17 had signs limited to both apices, of these all improved but 3; one of the 3 would apparently have recovered had he not left for home before being cured.

Dr. Williams says that 17 of his cases had only apical lesions; whether these include those in which both apices were affected he does not explain. In the rest of the 62 cases of the first stage—viz., 46, the tuberculization was more or less extensive, in many very much so.—Of the 79 cases of softening and excavation 49 were in the second stage, softening, and 30 in the third stage, having cavities already formed. As

most of the serious cases were for long periods under close observation, I believe the diagnosis of the cavities was generally correctly verified or refuted, and therefore the distinction is approximately correct—viz., that there were 30 with distinct cavities on arrival. Dr. Williams speaks of 42 cases of excavation out of his 50 “where, as a rule, this process was already accomplished;” probably if those in the process of forming had been separated the number with distinct cavities would have been nearer the same number as I report.

Of my 30 cases with cavities, 27 had one lung alone affected—13 right and 14 left. Dr. Williams reports 28 with excavation of one lung, nearly the same; he also shows the greater tendency of the left to excavate, stating that the right lung was in the second and third stages in 19 and the left in 30. My cases show this also, but in a less degree—35 right and 37 left. Both lungs were in second and third stages in 7 cases of mine, while Williams reports 1 case. He also writes that his cases show a cavity with limitation of disease to a single lung in the proportion of 28 to 22, while mine show 58 to 22.

RESULTS.

FIRST STAGE.

62 cases.	Cured	36=58.04 per cent.	{	}	Improved, 54=87.09 per cent.
	G. Improved...14=22.93	“			
	Improved..... 4= 6.45	“			
	Worse..... 1= 1.61	“			
	Death 7=11.29	“			

SECOND AND THIRD STAGES.

79 cases.	Cured.....11=13.92 per cent.	{	}	Improved, 41=51.89 per cent.
	G. Improved...14=17.72			
	Improved.....16=20.25			
	Worse..... 2= 2.53			
	Death 36=45.56			

TOTALS.

141 cases.	Cured.....47=33.33 per cent.	{	}	Improved, 95=67.37 per cent.
	G. Improved...28=12.76			
	Improved.....20=14.11			
	Worse..... 3= 2.12			
	Death 43=34.96			

Tubercle bacilli in the sputum.—It has been my custom for the past two and a half years to have each case examined for them, but as these reports are of cases almost all before that period, no report on this point can be made at this time.

Medicine and diet.—None of the specific forms of treatment,

such as creosote, etc., have been found encouraging to use. Tonics, malt and cod-liver oil and hypophosphites have been used more or less, though the need for them has generally been less obvious here than at home; alcohol in different forms in moderation only. Great relief and no apparent injury has been obtained from antipyretics where the fever was distressing, and for troublesome cough, much expectoration and laryngeal and bronchial complications, the use of the Globe inhaler with various drugs, notably benzoin, I have found of much benefit. Symptoms and complications generally have been treated where interfering with the general improvement. Massage and modified gymnastics have been used, the regulation of rest and exercise being urged, but with difficulty carried out. The diet has been as closely attended to as possible, and in the graver cases frequent feeding and milk and raw eggs were used. Milk was used with benefit by most of the patients. Horseback exercise was found one of the best for many.

Length of residence.—Here it is very difficult to give any figures that, as regards their bearing on results, might not be misleading, and especially so in a comparison with the length of residence in Alpine resorts, chiefly because so many invalids come and make their permanent residence in Colorado, as they often find opportunities to engage in work or business and a pleasant residential society. Then again, as there is no falling or melting snow period, as in the Alps, patients often stay both winter and summer in Colorado until well. It is, therefore, true that the length of residence is usually greater in Colorado than in the Alps, but whether a result is reached in a longer or shorter time on an average it is impossible to say.

The question of leaving or remaining in Colorado is an interesting one. Of the 141 patients, 59—i.e., 41.84 per cent—left Colorado. Of these, 45—i.e., 61.44 per cent—are to-day in the improved class, as they were on leaving, while 38.31 per cent were worse on leaving, or became so since. Of the 59 who left, 33 had been or were in the first stage; 26 in the second and third. Of the 82 who remained, 58.15 per cent of the whole, 82.76 per cent are in the improved class, while only 17.24 per cent are in the worse. This indicates that several of those who went away might have been improved by a

longer or a permanent residence. On the other hand, of those who remained and improved there are undoubtedly several who are well enough to leave, 19 being pronounced cured, and from my knowledge of their condition I believe it is fair to assume that about 50 per cent of the total number coming to Colorado can return to their homes to live with safety, providing, of course, the danger is only climatic. The percentage of improvement and number who could have returned permanently to their homes would have been very much higher had several more exercised forbearance in delaying their return until their disease was more decidedly arrested. I am firmly of the belief cases cured in elevated countries have at least as good a chance of keeping well after returning home as those cured at sea-level, and owing to the decided increase of general and pulmonary vitality imparted by the climate, probably a much better one. I am sorry I am unable, at the present time, to give such further analyses of my cases as Dr. Williams and Dr. Denison have done, especially as regards local results, but must proceed to close with a review of the gross results.

Gross results.—I find that, dividing my general results into two broad classes of those who were improved after a residence in Colorado and those who were made worse, as is done by Dr. Fisk, that there were 67.3 per cent improved and 32.62 per cent worse, which corresponds with his figures, showing that improvement is to be expected in two out of every three consumptives coming to Colorado. Dr. Denison's statistics show a little better than this, giving only 28 per cent worse. I think, however, if the subsequent histories had been traced as closely as mine, probably the percentage of worse would have shown nearer the full one third that Dr. Fisk's and mine exhibit. Turning to Dr. Williams's report, however, we find his gross results much better—74.82 per cent more or less improved and only 21½ per cent deteriorated, thus indicating that three out of four improved in the Alps, while only two out of three improved in Colorado. However, when we allow for *difference of material* we find the results very similar. In the Alpine cases (Williams) 64½ per cent were in the first stage, whereas in the Colorado cases (Solly) there were only 43.97 per cent. Also, as regards *complications*, they were more and graver in the Colorado than in the Alpine,

there being 20 cases which reached Colorado with evidence of tuberculosis elsewhere besides in the pulmonary tissues, 7 being cases of laryngeal tuberculosis and one with advanced lardaceous kidney disease. With regard to *length of illness* prior to coming to the altitude : of the Colorado cases, the average length for males was 32.04 months ; Alpine, 24.0 ; females, 23.91 months ; Alpine, 19.31 months. The Colorado cases show 52 of the 141 only whose illness was under one year, while there were 82 patients of this class who went to the Alps. *The difference between English and American invalids* doubtless explains why the cases should arrive in Colorado in worse and more advanced condition than in the Alps, as shown by comparing Drs. Denison's, Fisk's, and my own with Dr. Williams's cases. The American male, more than the female, will neglect the first warnings of disease and continue his necessary occupation or unnecessary worship of mammon long after his physician has warned him to flee to the mountains, and when he ultimately goes his disease has reached a further stage, and he has used up his reserve force. Once an enforced exile and invalid, being unaccustomed to loaf, he frets under leisure and applies himself too vigorously to recreation or a study of his symptoms, or else, missing his accustomed round, sinks into apathy. His temperament, which is usually nervous, makes all this more trying for him, and renders him also a bad judge of what amount of exercise he should take, etc. While he has had little training in submitting to dictation, he will not subject himself to rules laid down by his physician, and will rarely use them unless alarmed, often unreasonably, at some turn in his disease. The class of English from whom Dr. Williams's patients are drawn, on the other hand, are persons who usually seek advice early, follow it when taken, and by long practice find loafing easy, their phlegmatic temperament and habits of looking up to some one above them making them more docile as patients and less easily alarmed. The conclusion is a just one, I believe, that, other things being equal, there is a close resemblance between the results of treatment of phthisis in the Alps and Colorado. It is probable that early cases of apical first stage, occurring in persons without a marked tuberculous diathesis or heredity, would do equally well in either. Where a prolonged residence either

on account of advanced disease, diathesis or heredity is desirable, or the necessity of remunerative occupation exists, Colorado would be preferable. In the Alps there is less wind and dust, in Colorado more dryness and sunshine. If now Dr. Williams's tables are combined with Drs. Denison's, Fisk's, and my own, we get the results of high altitude treatment in about 600 cases, and can show improvement in something better than two out of three, which, as Dr. Williams and others have shown, far exceeds any other percentage of improvement put forward—as, for instance, Dr. Dettweiler's 1022 cases show improvement in only about one quarter, although in his closed sanitarium the elements of preventable deterioration by carelessness and ignorance, which undoubtedly influence unfavorably the results of the open sanitaria, are eliminated.

No.	Name.	Sex	Age	Date of 1st Visit.	Nature and Extent of Disease.	L'gth of illness before coming to Col.	Family pre-disposition.	Hæmop-tysis.	Length of residence.
1	H. B.	M.	32	1875, Sept. 17.	Both. Third stage; left upper, large cavity. Second right, upper consolidation; chronic laryngitis; no fever or night sweats. General condition fair.	5 years.	None.	Slight at first, severe later; none since coming.	Off and on 10 years.
2	C. H.	M.	32	Oct. 5.	Both. Third, large cavity, upper right; small cavity, left upper. Illness began acutely, March, 1871; fever; night sweats; very weak.	1½ yrs.	Father and mother, 2 sisters; 3 in infancy; 1 delicate.	Frequent and protracted at all stages; severe since coming.	18 years, with a few months' absence
3	C. M.	M.	33	1876, April 22.	Both. Second stage; right upper, complete consolidation, slight left apex. Bronchitis; slight fever; marked malaise; nervous.	1 year.	Mother.	Frequent, but slight; some since.	12 years, with absences.
4	L. B.	M.	40	1876, Nov. 18.	One. Third; left lower, small cavity, pleuritic adhesions; heart drawn over to right; diarrhoea; no fever or night sweats; fair condition.	1 year.	None.	None.	11 years, with absences.
5	A. S.	M.	31	1877, Oct. 19.	Both. Second, right upper; second left apex; bronchitis, fever, night sweats; poor digestion and physique very weak.	10 yrs.	None.	Severe in all stages; some since.	5 years.
6	H. W.	M.	31	1877, Oct. 6.	One. Second, right upper; tuberculous testicle; no fever or night sweats; fair condition.	5 years.	1 brother.	None.	13 yrs.
7	R. C.	F.	34	1878, June 3.	Both. Third, right apex; first left apex; fever; night sweats; poor digestion; very weak.	4 mos.	3 sisters.	None.	4½ months.
8	H. S.	M.	24	1878, Aug. 28.	Both. First, both apices; fever; weak.	2 years.	Father.	None.	12 yrs.
9	F. H.	M.	21	1878, Oct. 10.	One. First, left apex; slight fever and slightly weak.	15 mos.	Father.	None.	13 yrs.
10	M. B.	M.	32	1878, Nov. 8.	One. Second, right upper half; bronchitis; no fever or night sweats; fair condition.	6 years.	1 sister.	Several slight; none since.	3 years.
11	H. S.	F.	18	1878, Oct. 8.	One. First, right lower; no fever or sweats; dyspeptic; general malaise.	6 mos.	2 aunts, 1 uncle.	None.	8 mos.
12	D. S.	M.	26	1878, Nov. 13.	One. First, left upper; tubercular laryngitis; fever, night sweats, acute onset; weak, dyspeptic.	8 mos.	M. grandmother, 1 sister.	None.	6 mos.
13	G. G.	M.	21	1879, May 24.	One. First, right, middle and lower; heart drawn over to right; began with pneumonia; no fever; fair strength.	3 years.	None.	None.	10 mos.
14	W. B.	F.	16	1879, June 24.	Both. Third, both apices; diarrhoea; fever; sweats; very weak.	1 year.	Mother, 1 aunt.	Several slight; none since.	6 weeks.
15	A. P.	M.	24	1879, Dec. 15.	Both. First, both apices; no fever; general condition fair.	2 mos.	None.	None.	6½ months.
16	J. G.	M.	32	1879, Dec. 16.	One. Second, left lower; fever; sweats; weak; emaciated.	6 mos.	None.	Slight; none since.	7 years.
17	D. P.	M.	25	1878, July 2.	One. First, right upper; fever; sweats; very weak; acute onset, with hæmoptysis.	6 mos.	Mother.	Several slight; few since.	12 yrs.
18	C. D.	M.	32	1879, July 30.	Both. First, both apices; ankylosed hip; slight fever; fair condition.	8 mos.	Mother.	Several severe; none since.	4 years.
19	H. W.	F.	36	1879, Sept. 4.	One. Second, left upper; cardiac dilatation; melancholia; no fever; weak; bronchitis.	10 yrs.	2 sisters, 1 brother.	Several slight; none since.	12 yrs.
20	S. W.	F.	40	1878, July 23.	Both. Third, both upper; asthma.	3 yrs.	None.	None.	12 yrs.

General Result.	Weight.	Local result.	Chest circumference.	Notes.
Greatly improved.	Slight increase.	Contraction of cavity and clearing of right lung.	Increase.	Remained in Colorado during winters; went East in summers for ten years. Has been living and well in East last five years.
Cure.	20 lbs.	Cavities cicatrized; vesicular murmur clear and vigorous everywhere.	Much increase.	Has continued active in office business in Denver and Colorado Springs past nine years. Has lived East six months without harm.
Greatly improved.	Increase.	Fibrosis of right; clearing of left.	Increase.	Remained two years without change; then went East in summers last ten years of residence; lived East last two years well.
Death.	Less.	Cavity quiet till last year; fibrosis through left lung; heart disease developed.	Increase.	Was able to do a great deal of work; never strong; frequently changed climate last three years.
Death.	Gain and then loss.	Cavity formed in right upper; left cleared; then acute bronchitis left.	Increase.	After passing through stage of excavation, got into fair condition, though always delicate; carried off by acute bronchitis, which came on few weeks before death.
Worse.	Less.	Cavity in right upper, with general fibrosis of right; consolidation of left apex.	First increase, then loss.	Is in poor condition, weak and thin; drives about; has been about the same for last year. Short summer trips East.
Death.	Less.	Tuberculosis spread through right and some in left.	Increase.	Slight improvement first month. Then much fever.
Cure.	Gain.	At first extension, then clearing.	Increase.	Remained at first four months nearly well. Went back East, got ill again. Tried Florida, Georgia and South California, March, 1883. Returned to live, here now.
Cure.	Gain.	Cleared up entirely in few months.	Increase.	Remarkably strong; lives here, but spends long intervals away without harm.
Cure.	Gain.	Clearing.	Increase.	Resumed business as traveller; keeps well in the East.
Cure.	Gain.	Complete clearing.	Increase.	Lives East; married since; healthy; children well.
Death.	Less.	Extension in both lungs; breaking down.	Less.	Laryngeal ulcers healed at first under treatment; ulceration returned in last month.
Cure.	Gain.	Cleared up entirely.	Increase.	Returned home; seen recently, well.
Death.	Less.	Rapid softening.	Nil.	Temporary revival of strength.
Death.	Gain.	Lungs cleared; went home; remained well one year; then rapid softening and death.	Increase.	When he returned home, pronounced well, and appeared so for a year; then second attack fatal.
Improved.	Less.	Fibroid contraction.	Nil.	Got strong; worked hard on ranch; no chest symptoms; lived here; took rheumatic fever, and died in seven years of cardiac mitral disease.
Cure.	Gain.	Complete clearing up.	Increase.	Lives an active life in Colorado; married; very robust.
Cure.	Gain.	Complete clearing up.	Increase.	Living and strong in New England; heard of three years ago.
Improved.	Less.	Fibrosis, left upper cardiac compensation. Bronchiectasis.	Increase.	Has dyspnoea and much expectoration on exertion; seems fairly strong; gets about; remains the same; lives here.
Improved.	Gain.	Fibrosis; bronchiectasis.	Increase.	Has dyspnoea on exertion; gets about; remains much the same; no asthma; lives here.

No.	Name.	Sex	Age	Date of 1st Visit.	Nature and Extent of Disease.	L'gth of Illness before coming to Col.	Family Pre-disposition.	Hæmoptysis.	Length of Residence.
21	E. H.	M.	18	1880, Feb. 2.	One. First, right upper; no fever; pale and weak.	16 mos.	None.	None.	1½ yrs.
22	W. B.	M.	23	1880, May 10.	One. First, right apex; no fever; fair strength; strumous cervical glands.	1 year.	Father strumous, 2 brothers.	Slight; none since.	10 yrs.
23	J. A.	M.	32	1880, Nov. 18.	One. Third, left upper; medium cavity; chronic laryngitis; no fever; fair condition.	1½ yrs.	None.	None.	1 year.
24	F. S.	M.	28	1880, — 19.	One. Second, left upper; cavity forming; fever; night sweats; fair strength and condition.	7 years.	None.	Frequent, severe; several since.	6 years.
25	S. F.	M.	24	1880, — 22.	One. First, left upper; no fever; fair condition; onset acute.	8 mos.	None.	None.	10 yrs.
26	T. S.	M.	19	1880, — 24.	Both. First, both apices; most left; slight fever; no sweats; rather weak.	8 mos.	Father.	Slight at beginning; none since.	10 yrs.
27	E. W.	F.	24	1881, Jan. 7.	One. Second, right upper; slight fever; no sweats; weak; dyspeptic.	3½ yrs.	None.	None.	9½ yrs.
28	W. N.	M.	35	1881, April 2.	One. Third, right upper and second lower lobe; fever; night sweats; fair strength.	8 years.	Father.	Several profuse; none since.	9 years.
29	H. W.	M.	30	1881, July 22.	One. First, left upper; slight fever; weak; had recently got worse.	14 yrs.	Very marked.	Several slight; none since.	10 yrs.
30	H. G.	M.	25	1881, July 27.	One. Second, left lower lobe; consolidation left apex; fever; night sweats; weak.	6 mos.	Mother, G. M. aunt, 1 brother.	Several severe; slight since.	9 years.
31	F. G.	M.	21	1881, July 27.	Both. Second, at both apices and left base; fever; sweats; weak.	2 years.	Mother, G. M. 1 aunt, 1 brother.	Several severe; none since.	6 mos.
32	T. M.	M.	34	1881, July 30.	One. First, left upper; fever; night sweats; weak.	15 yrs.	None.	Slight; none since.	9 years.
33	A. K.	M.	22	1881, Dec. 27.	One. Second, right upper; bronchitis; no fever; fair condition.	3½ mos.	1 brother.	Few slight; none since.	3 years.
34	F. H.	M.	20	1882, Jan. 25.	One. First, left upper; fever; sweats; weak.	10 mos.	None.	Slight; none since.	5 mos.
35	C. T.	F.	34	1879, Oct. 29.	One. Second, right upper; fever; sweats; weak.	6 mos.	None.	None.	1 year.
36	G. H.	F.	21	Feb. 27.	One. First, left apex; fever; sweats; weak; anemic.	1½ yrs.	2 sisters, 1 brother.	None.	3 years.
37	G. R.	M.	26	April 18.	Both. Third, both apices; fever; sweats; weak; albuminuria.	14 mos.	Father strumous, 1 brother hydrocephalus.	None.	2 mos.
38	J. B.	F.	37	July 1.	Both. Third, right upper; small cavity; second left apex; fever; sweats; weak; chronic laryngitis; aphonia.	5 years.	2 half brothers.	None.	8 years.
39	G. M.	M.	41	May 8.	Both. Second, right upper; first left apex; no fever or sweats; fair strength.	2 years.	Mother.	None.	3 years.
40	F. F.	M.	27	— 9.	One. Third, right upper; large cavity; fever; sweats; very weak.	1 year.	2 aunts, 1 uncle.	Slight; none since.	3 years.

General Result.	Weight.	Local Result.	Chest Circumference.	Notes.
Cure.	Gain.	Complete clearing up.	Increase.	Returned East to college; well and robust; married last year.
Cure.	Gain, 15 lbs.	Complete clearing; glands shrunk after iodoform treatment.	Increase.	In vigorous health; lives here; spends half year (summer) in East.
Death.	Gain.	Condition somewhat improved till last few days; then tubercular meningitis.	Increase.	Improved greatly; had bronchitis; improved again; then meningitis and death.
Death.	Less.	Large cavity formed in left upper lobe; then stationary till last two months, when extension.	Increase.	Improved very much after excavation ceased; active in business; lived in Colorado; sudden death from haemoptysis.
Cure.	Gain.	Cleared up entirely.	Increase.	Lives in Colorado; active in business; vigorous; goes East at all seasons.
Cure.	Gain.	Cleared up entirely.	Increase.	Very robust; lives on ranch; spends summers East.
Greatly improved.	Gain.	Fibrosis.	Increase.	General health and vigor fair; lives here; goes East occasionally in summer.
Greatly improved.	Gain.	Contraction of cavity; fibrosis.	Increase.	General health and vigor very fair; active in business; spends time in this State and New Mexico.
Cure.	Gain.	Cleared up.	Increase.	Active in business; vigorous; lives here; goes East summers.
Improved.	Gain.	Moderate cavity formed in left lower lobe; now contracted; consolidation at left apex cleared; consolidation at right apex then clearing.	Increase.	Has evidently a tuberculous kidney and testicle; still slight albuminuria; lives here and in New Mexico; is in very fair health.
Death.	Less.	Breaking down of left lung after slight arrest in first few months.	Nil.	Left here and died 1½ years later in Los Angeles.
Cure.	Gain.	Cleared up.	Increase.	Is strong and healthy; actively employed in Denver; East occasionally.
Death.	Less.	At first signs almost disappeared; then acute pneumonia, right base; then cavity.	Less.	Was apparently nearly well, when, after foolish exposure, took pneumonia; died in England eight months later.
Death.	Less.	Apparent clearing up of lung; then tubercular meningitis.	Increase.	Seemed doing well; getting strong till two days before death from tubercular meningitis.
Cure.	Gain.	Begun clearing at once; examination two years after leaving showed complete clearing.	Increase.	Slight signs, but was strong and vigorous when returned home; since quite well.
Cure.	Gain.	Lung cleared entirely.	Increase.	Got quite strong; returned home to coast; had healthy child; very well.
Death.	Less.	Breaking down and extension.	Nil.	Had lardaceous renal disease; was careless, caught cold; died of uræmia.
Greatly improved.	Gain.	Fibroid contraction around cavity; left cleared.	Increase.	Larynx had superficial ulceration and suspicious swelling, but healed; is vigorous; lives here; East summers.
Greatly improved.	Gain.	Fibrosis right; left cleared.	Increase.	Got strong and continues so; living and working in the East.
Death.	Less.	Extension of cavity, and extension to left apex.	Nil.	Local condition remained stationary, but general health improved till he went home, and returned here to die, one year later.

No.	Name.	Sex	Age	Date of 1st Visit.	Nature and Extent of Disease.	L'gth of Illness before coming to Col.	Family Predisposition.	Hæmop-tysis.	Length of Residence.
41	C. M.	M.	49	1882, Aug. 1.	Both. Second stage; left upper lobe, fibrosis; right apex consolidated; tubercular laryngitis; no fever; general health fair.	½ yrs.	None.	None.	1 year.
42	C. S.	M.	20	Oct. 4.	One. Second, left upper; no fever; fair condition.	4 years.	None.	Slight; none since.	20 mos.
43	L. D.	M.	28	Nov. 10.	Both. Second, both uppers; fever; sweats; weak, pig-eon chest.	2½ years	None.	None.	2½ years.
44	J. I.	M.	18	Nov. 13.	One. First, left upper; slight fever; no sweats; rather weak.	1½ yrs.	Father.	None.	1½ years.
45	F. W.	M.	29	Nov. 27.	One. First, right lower; no fever; general health fair.	11 mos.	None.	None.	8 years.
46	E. K.	F.	26	Jan. 4.	Both. Second, both apices; fever and sweats; anaemic; slight physique; weak.	4 years.	None.	Slight; none since.	8½ years.
47	J. Y.	M.	37	Dec. 15.	One. First, left upper; no fever or night sweats; fair condition.	6 mos.	Father, sister.	Several slight; none since.	1½ years.
48	B. A.	M.	42	Dec. 22.	One. First, right middle; slight fever; night sweats; weak; bronchitis.	14 years	None.	Several slight; slight since.	8 years.
49	E. A.	F.	16	1884, Nov. 12.	One. First, right apex; no fever; fair condition.	7 mos.	Pat. G. F., 1 brother.	None.	6 mos.
50	E. W.	M.	39	1886, Aug. 9.	Both. Second, left upper; first right apex; chronic laryngitis; no fever; moderate strength.	5 mos.	None.	None.	10 mos.
51	T. F.	M.	26	1884, April 4.	One. First, left apex; no fever; good condition.	6 mos.	None.	Several slight; none since.	6 mos.
52	T. H.	M.	39	1887, July 6.	Both. First, both apices; slight fever; no sweats; good condition.	8 mos.	None.	Slight; none since.	5 mos.
53	R. B.	M.	31	July 14.	Both. Third, right upper and middle and left apex; fever; sweats; very weak; dyspepsia.	6 years.	1 brother.	Several slight; none since.	2 mos.
54	S. S.	M.	29	1875, Jan. 6.	One. Second, right middle; no fever; good condition.	10 years	1 aunt, 1 brother.	None.	15 years.
55	W. M.	M.	26	1886, May 3.	Both. First, both apices; no fever; fair condition.	1½ years	1 aunt, 1 sister.	None.	1 year.
56	G. H.	M.	32	1885, July 21.	Both. Third, right upper; small cavity at left apex; fever; night sweats; weak.	2 years.	None.	Several slight; none since.	13 mos.
57	W. W.	M.	37	1887, Dec. 11.	Both. First, both apices; no fever; dyspepsia; poor condition.	2 years.	Mother.	None.	7 mos.
58	L. H.	M.	21	1885, May 27.	Both. First, both apices; no fever; old mitral regurgitation murmur; poor condition.	4 mos.	Father, mother, 2 sisters.	None.	1 year.
59	H. T.	M.	37	1887, Dec. 19.	One. Third, right apex (large cavity); no fever; fair condition.	12 years	2 sisters.	Few slight; none since.	4½ mos.
60	H. P.	M.	24	1883, June 1.	Both. First, left apex and extreme base and first right apex; slight fever; fair condition.	20 mos.	Grandmother, 2 sisters.	Several slight; none since.	1 year.

General Result.	Weight.	Local Result.	Chest Circumference.	Notes.
Death.	Slight loss.	On leaving for home, right lung clear, left stationary; throat healed, with tissues thickened.	Slight increase.	Had good voice and general vigor; fibroid lung the same; went back to work in East; died two years later.
Death.	Less.	Breaking down left, extension to right. Otorrhœa.	Increase.	Improvement both local and general first fourteen months; rapid decline last six months. Died here.
Death.	Less.	Cavity formed in left, and breaking down began in right.	Less.	Remained here at first $1\frac{1}{2}$ years; marked improvement; some clearing; went East; returned worse; died one year later.
Cure.	Gain, 20 lbs.	Complete clearing up.	5 inches expansion.	Returned home to England; living there, well.
Greatly improved. Worse.	Less.	Fibrosis.	Increase.	Lives here; goes East in summer; able to work; no symptoms; keeps thin.
	Less.	Cavities formed at both apices; pneumonic consolidation at right base.	Less.	Did well up to two years ago, when went to live on mountain ranch; poor food and hard work developed a mitral systolic bruit, and excavation took place; returned here to Sanitarium; slight improvement.
Cure.	Increase.	Cleared up entirely.	Increase.	Returned home East; living and working; well.
Improved.	Increase.	There was a moderate increase of area of consolidation; since stationary.	Increase.	The tuberculosis appears to be arrested; the general health is lately improved, but attacks of gouty bronchitis occur; lives here; goes away for a month or so in summer.
Cured.	Increase.	Cleared up.	Increase.	Got very strong and well; returned to England; heard of $1\frac{1}{2}$ years ago.
Greatly improved.	Increase.	Fibrosis left; right cleared; voice improved.	Increase.	Returned to business East in a year; was well a year ago.
Cured.	Increase.	Cleared up entirely.	Increase.	Returned East; well; at office work.
Greatly improved.	Increase.	Some consolidation left, when went East.	Increase.	Returned East; is at work, and apparently well.
Death.	Decrease.	Breaking down progressed steadily; death by heart failure.	Nil.	No rallying; steady decline.
Cured.	Decrease.	Cleared up entirely.	Increase.	Had an attack of croupous pneumonia same lung; now living here, well and active; frequent visits East.
Greatly improved.	Increase.	Was clearing when moved to other part of Colorado.	Increase.	Returned to Canada; practising physician; reported himself well eighteen months ago.
Death.	Loss.	Slow but steady breaking down.	Nil.	No pause in progress downward.
Improved.	Increase.	Fibrosis, with partial clearing.	Increase.	Returned East to office work; reported as holding his cure, but not well.
Cure.	Increase.	Lungs cleared, heart the same.	Increase.	Returned East to office work, strong; reported well two years ago.
Improved.	Increase.	When left, cavity quiet; seemed contracting.	Increase.	Returned to England; general health much more vigorous; heard of this year as doing fairly.
Cure.	Gain.	Cleared up entirely.	Gain.	Returned East to work; in city for last five years; keeps well.

No.	Name.	Sex	Age	Date of 1st Visit.	Nature and Extent of Disease.	L'gth of Illness before coming to Col.	Family Predisposition.	Hæmoptysis.	Length of Residence.
61	G. W.	F.	30	1883, July 2.	One. First, left apex; no fever; poor condition; anæmic.	2 years.	Mother, 2 uncles.	None.	7 years.
62	A. W.	F.	35	1883, Aug. 28.	One. First, right upper half of lobe; fever and night sweats; fair strength.	2 years.	Father.	None.	1 year.
63	J. O.	F.	29	1883, Dec. 17.	One. First, right upper; no fever; weak, dyspeptic.	8 mos.	Mother.	None.	8 mos.
64	F. M.	F.	32	1883, Dec. 18.	One. Second, left upper (cavity forming); bronchitis; slight fever; condition fair.	2 years.	4 uncles, 2 sisters and 1 brother.	None.	5 years.
65	R. T.	M.	35	1884, Feb. 24.	One. First, right upper; first, middle and lower lobes; slight fever and night sweats; weak.	1 year.	Mother.	Several slight; none since.	3 years.
66	J. R.	M.	28	1884, Feb. 17.	One. First, left apex; history of first affection being in right apex; no fever; weak, nervous exhaustion.	1½ yrs.	None.	Several slight; none since.	2 years.
67	F. N.	F.	28	1884, May 10.	One. Second, right upper; bronchitis at base; fever; night sweats; weak.	2 years.	None.	None.	2 years.
68	B. H.	F.	31	1884, May 26.	One. Third, left upper; slight fever and sweats; weak; small cavity.	6 mos.	None.	Slight; none since.	1 year.
69	A. F.	M.	33	1884, Sept. 15.	One. First, right apex; bronchitis below; chronic pharyngitis; no fever; fair condition.	1 year.	Grandmother and 1 aunt.	None.	8 mos.
70	G. C.	M.	23	1884, Oct. 31.	One. Second, right apex; bronchitis; fever; night sweats; weak.	8 mos.	None.	None.	1½ years.
71	H. W.	F.	40	1884, Nov. 1.	Both. First, both apices; pleurisy, left lower; no fever; weak.	9 mos.	None.	None.	6 years.
72	S. M.	M.	24	1884, Nov. 18.	Both. Third, left upper (contracted cavity); second right apex; no fever; general health fair.	5 years.	Grandmother and 1 aunt.	None.	6 years.
73	W. F.	M.	37	1884, Nov. 20.	Both. First, both apices; no fever; neurasthenia; moderate strength.	20 mos.	None.	Several severe; some since.	6 years.
74	J. H.	M.	46	1884, Nov. 28.	One. First, left upper; no fever; neuralgia; fair condition.	3 years.	None.	Several severe; none since.	6 years.
75	C. L.	F.	32	1885, June 8.	One. First, right apex; no fever; chronic laryngitis; dyspeptic; weak.	2 years.	1 uncle and several cousins.	None.	1 year.
76	M. H.	M.	46	1885, Nov. 6.	One. Second, fibroid consolidation right middle lobe; fever; night sweats; moderate condition.	3 years.	1 uncle, father bronchial.	None.	5 years.
77	R. J.	M.	18	1885, Dec. 29.	One. First, left apex; fever; sweats; nervous; weak.	3 years.	7 uncles and aunts.	Several slight; none since.	5 years.
78	W. P.	M.	36	1885, Dec. 8.	Both. Second, right upper; left apex; no fever; fair condition.	4 years.	2 first cousins.	None.	5 years.
79	B. S.	F.	32	1885, April 10.	One. First, left apex; slight fever; chronic laryngitis; fair condition.	6 mos.	None.	Slight; none since.	2 years.
80	R. B.	M.	32½	1885, May 28.	Both. First, right apex and left upper; bronchitis.	18 mos.	Mother.	Slight; none since.	2 years.

General Result.	Weight.	Local Result.	Chest Circumference.	Notes.
Greatly improved.	Gain.	Fibrosis.	Gain.	Has lived mostly since in Colorado, going East for two or three months at time; in business in Denver last four years.
Cure.	Same.	Cleared up.	Gain.	Returned East; examined three years ago; quite well.
Cure.	Increase.	Cleared up.	Gain.	Returned East, well.
Improved.	Less.	Dry cavity; less bronchitis.	Gain.	Returned home fairly; not able to do much.
Greatly improved.	Gain.	Fibrosis of right upper; clearing of middle and lower lobes.	Gain.	Returned East; heard of two years ago as well.
Cure.	Gain.	Cleared up entirely; neurasthenia disappeared.	Gain.	Returned East; is well and at work; strong.
Improved.	Gain.	Cleared up partially.	Gain.	Returned East; is not strong, but no chest symptoms.
Greatly improved.	Loss.	Fibrosis; cavity contracted.	Gain.	Returned East; fair health year ago.
Cure.	Gain.	Cleared up.	Gain.	Returned to New England; well and at work.
Cure.	Gain.	Cleared up.	Gain.	Went and lived in Kansas; well until death from accident, one year ago.
Cure.	Gain.	Cleared up.	Gain.	Lives here, active and well; no symptoms for three years.
Greatly improved.	Less.	Cavity quiet; right cleared.	Gain much.	At beginning of attack went to Davos, where disease arrested; came and settled here; gained in strength and local condition.
Worse.	Less.	Breaking down at both apices, then fibrosis.	Nil.	Lives here; slowly losing.
Much improved.	Gain.	Partial clearing; some fibrosis.	Increase.	Lives here; goes East winter and summer; active and strong.
Greatly improved.	Gain.	Partial clearing up.	Increase.	Returned to New England; fair health.
Cure.	Gain.	Cleared up.	Increase.	Lives here; hearty; active in business.
Greatly improved.	Gain.	Some extension, then partial clearing.	Increase.	Lives East; no lung symptoms. Had slight heart strain; neurotic; fair strength.
Improved.	Gain.	Partial clearing.	Increase.	Lives here; engaged in business; fair general health.
Cure.	Gain.	Clearing up.	Increase.	Lives in Europe; here recently on visit; keeps well.
Cure.	Gain.	Clearing up.	Increase.	Returned to England well last year.

No.	Name.	Sex	Age	Date of 1st Visit.	Nature and Extent of Disease.	L'gth of Illness before coming to Col.	Family Pre-disposition.	Hæmoptysis.	Length of Residence.
[81]	A. A.	F.	21	1883, July 3.	One lung. Second stage, left lung; upper lobe; bronchitis; fever; night sweats; weak.	7 years.	None.	None.	3 years.
82	G. D.	M.	53	1885, March 31.	Both. Second, lower; fever; weak.	2 years.	None.	None.	2 years.
[83]	L. E.	M.	37	1885, Dec. 21.	One. Second, right base; no fever; condition fair.	7 years.	Father.	Slight; none since.	4½ yrs.
84	E. P.	F.	25	1885, Dec. 17.	One. Second, right middle and lower; slight fever and sweats; bacilli; fair strength.	1½ yrs.	None.	Slight; none since.	6 mos.
[85]	A. R.	M.	36	Nov. 14.	Both. Third, right base, small cavity; first stage, both apices; no fever; fair strength.	4 years.	Sister.	Several severe; none since.	5 years.
[86]	C. W.	M.	60	1886, Dec. 3.	Both. First, right middle and upper; left, small patch of consolidation at angle of scapula; bronchitis; chronic laryngitis; no fever; weak.	3 years.	2 mat. aunts.	Slight; none since.	4 years.
[87]	H. S.	M.	30	Jan. 4.	One. First, left apex; fever; night sweats; weak.	1 year.	1 uncle.	None.	6 mos.
88	J. E.	M.	46	Feb. 11.	One. Second, left lower; slight fever and sweats; nasal catarrh and fair condition.	1 year.	1 uncle and 1 aunt.	Slight; none since.	4 years.
89	R. R.	F.	25	1885, March 10.	Both. Third, left lower, small cavity; first at both apices; no fever; good condition.	7 years.	None.	Several severe; few moderate since.	5 years.
90	J. A.	M.	46	1886, May 3.	One. First, right upper and middle; chronic laryngitis; had acute pneumonia two years ago; fever and night sweats; weak.	2 years.	None.	None.	2 years.
91	T. W.	M.	26	July 1.	Both. Third, left upper, contracting cavity; first, right apex; some bronchitis; very nervous; no fever; very weak.	3 years.	None.	Slight; none since.	3 years.
[92]	K. McC.	F.	27	July 7.	Both. Second, right apex and left base; no fever; very weak.	3 years.	None.	None.	4 years.
93	J. T.	M.	40	July 27.	One. First, right base; old scar at left apex quiescent; no fever; weak.	3 mos.	None.	Slight; none since.	10 mos.
94	R. M.	M.	33	Oct. 14.	One. Second, left apex; chronic laryngitis; fever; night sweats; rather weak.	1 year.	Pat. G. father.	None.	4 years.
95	W. E.	M.	36	Oct. 19.	Both. First, right upper and left base; bronchitis; no fever; very nervous; rheumatic; fair condition.	20 mos.	Father, mother, 1 aunt, 2 uncles, 4 brothers.	Several severe; none since.	1 year.
96	C. O.	M.	27	Nov. 11.	One. First, right apex; first, right base; no fever; fair condition.	3 years.	Father, mother, 3 uncles, pat. G. P.	Several slight; 1 since.	1 year.
97	L. H.	M.	29	Dec. 15.	Both. First, right upper and left apex; no fever; condition fair.	1½ yrs.	None.	Several slight; none since.	2½ yrs.
98	A. J.	M.	30	Dec. 19.	Both. First, both apices; fever; night sweats; chronic laryngitis; bacilli; weak.	1 year.	Pat. G. father, 1 aunt.	Several slight; none since.	4 years.
99	E. H.	M.	21	1887, March 1.	One. First, left apex; no fever; dyspepsia; bacilli; good condition.	2 years.	Mat. G. mother, father, sister.	None.	3½ yrs.
100	E. B.	M.	28	April 20.	One. First, left; no fever; condition good.	4 mos.	None.	Slight; none since.	1½ yrs.

General Result.	Weight.	Local Result.	Chest Circumference.	Notes.
Improved.	Gain.	Drying up and partial clearing.	Increase.	Returned to London; health still improving.
Cure.	Gain.	Cleared up in both lungs.	Increase.	Returned to live in New England; keeps well.
Greatly improved.	Gain.	Lung is clearing.	Increase.	Lives here; very active; goes East occasionally; general health good; examined few weeks ago.
Cure.	Gain.	Complete clearing up.	Increase.	Has been travelling chiefly since leaving here; perfectly well two months ago.
Improved.	Same.	Fibrosis at apices and around cavity.	Increase.	Lives in Colorado and does office work; fairly strong.
Improved.	Gain.	Left cleared entirely; partial clearing of right and fibroid contraction.	Increase.	Lives in New Mexico in similar climate; all active symptoms ceased; is working; fair health.
Cure.	Gain.	Complete clearing up.	Increase.	Returned East to work; here on visit last year; was well.
Cure.	Gain.	Complete clearing up.	Increase.	Resides here; works hard in office; goes East on visits; very well.
Greatly improved.	Gain.	Right cleared entirely; left upper partially; cavity contracted.	Increase.	Lives here; works hard; been East on visit; general health very fair.
Cure.	Gain.	Cleared up.	Increase.	Returned East to work; well four months ago.
Greatly improved.	Gain.	Right cleared entirely; left cavity contracted; bronchitis disappeared.	Increase.	Living in Europe; kept well till acute pneumonia last winter; his physician reported he had made entire recovery from it.
Cure.	Gain.	Cleared up entirely.	Increase.	Lives here; married; one healthy child; keeps well.
Cure.	Gain.	Cleared up entirely.	Increase.	Returned East to office work; well last year.
Improved.	Same.	Consolidation partly cleared; laryngitis cured.	Increase.	Lives here; works hard; goes East in summer; would be quite well, probably, if not overworking.
Greatly improved.	Less.	Paid two visits here; much improved in first six months; clearing up; second visit less so.	Increase.	Went back East; got worse; returned second time; some improvement, which continued in California, where he now is comparatively well.
Much improved.	Gain.	Lung began to clear up; then caught cold, causing some extension at right apex, but was clearing up again when he left.	Increase.	Returned to England and continued to improve; seen there four months ago; apparently well.
Cure.	Gain.	Both sides cleared up entirely.	Increase.	Returned East to office work; continues well.
Much improved.	Less.	Some extension at first; now has fibrosis; no cough or other symptoms.	Increase.	Lives here; is in fair condition, but has naturally poor physique.
Cure.	Gain.	Cleared up.	Increase.	Lives here; naturally poor physique, but now looks strong and hearty.
Cure.	Same.	At first extension; then cleared up.	Increase.	Returned East; heard of recently as well.

No.	Name.	Sex	Age	Date of 1st Visit.	Nature and Extent of Disease.	L'gth of Illness before coming to Col.	Family Predisposition.	Hæmop-tysis.	Length of Residence.
101	H. L.	M.	40	1887, July 27.	One. Second, left upper; fever; weak; lumboago; very nervous.	2 years.	Paternal grandmother.	Slight; slight since.	3 years.
102	C. M.	M.	27	Aug. 13.	Both. Second, left upper and right apex; fever; rather weak; pigeon chest.	1 year.	None.	Slight; slight since.	3 years.
103	T. D.	M.	23	Aug. 28.	One. Second, left upper; no fever; general condition good.	3 years.	None.	Slight; none since.	3 years.
104	C. C.	M.	25	Aug. 25.	One. First, left upper; no fever; fair condition.	1 year.	2 uncles, father.	None.	3 years.
105	K. F.	M.	30	Sept. 16.	One. Second, left upper; slight fever; bronchitis; nasal stenosis; very nervous; condition fair.	1½ yrs.	None.	Several slight; some since.	3 years.
106	W. C.	M.	43	Oct. 22.	Both. Third, left upper, cavity; first, right upper; bronchitis; fever; night sweats; weak.	2½ yrs.	None.	None.	2 years.
107	E. L.	F.	47	Nov. 7.	One. First, right upper; fever; night sweats; weak.	2 years.	2 mat. aunts, 1 sister.	Slight; none since.	3 years.
108	M. M.	F.	25	Dec. 15.	Both. First, both apices; no fever; anæmic.	3 mos.	Mat. G. M., pat. G. M., 2 aunts, 2 uncles.	None.	5 mos.
109	T. G.	M.	20	1888, Jan. 2.	Both. First, both apices; fever; night sweats; condition moderate.	6 mos.	None.	Slight; none since.	6 mos.
110	L. M.	M.	24	Jan. 24.	One. First, right upper; no fever; tubercular laryngitis; weak.	3 years.	Mother, 2 mat. aunts.	None.	2½ years.
111	F. W.	M.	22	Feb. 26.	Both. First, both apices; fever; night sweats; anæmia.	2 mos.	Father, pat. G. F., 1 aunt, 1 brother.	Several slight; none since.	2½ years.
112	A. T.	M.	40	June 6.	Both. Third, right upper, cavity; second, left upper; fever; night sweats; weak.	4 years.	1 aunt, 1 brother, 1 sister.	Several slight; some since.	2 years.
113	R. N.	F.	30	June 11.	Both. Second, right upper, cavity forming; second, left apex; fever; night sweats; anæmia.	3 years.	3 uncles.	Several slight; some since.	2 years.
114	J. C.	M.	24	July 5.	Both. Third, right upper, large cavity; second, left base; fever; night sweats; heart displaced; weak.	3½ yrs.	None.	Several severe; medium since.	2 years.
115	M. H.	F.	25	Nov. 3.	Both. First, both apices; fever; night sweats; weak; meningeal symptoms.	2 mos.	Pat. G. F., 2 uncles, 3 sisters.	None.	2 years.
116	J. M.	M.	21	1883, Sept. 27.	Both. First, right upper, left apex; fever; night sweats; heart weak; poor condition.	2 years.	Father.	Several slight; none since.	2 years.
117	R. H.	M.	33	1883, June 28.	Both. Second, right upper and middle and left apex; fever; night sweats; diarrœa; dyspepsia; very weak; fibroid.	8 years.	None.	Slight; none since.	2½ mos.
118	J. A.	M.	22	July 14.	Both. First, right upper and part of middle; first, left apex; fever; night sweats; diarrœa; dyspepsia; heart weak.	2 years.	1 uncle, 1 brother.	Several slight; 1 slight since.	2½ mos.
119	F. S.	M.	26	Nov. 17.	Both. Third, left upper, cavity; second, lower lobe, first right apex; fever; night sweats; very weak.	1½ yrs.	Pat. G. F., 1 uncle.	Several slight; none since.	5 mos.
120	F. L.	M.	22	Nov. 17.	One. Second, right upper; fever; night sweats; weak.	1 year.	None.	Several severe; none since till fatal one.	1½ years.

General Result.	Weight.	Local Result.	Chest Circumference.	Notes.
Improved.	Less.	Fibrosis, with some little clearing.	Increase.	Lives here, and would apparently be well if he did not overwork in office; no chest symptoms.
Improved.	Less.	Right cleared, left partly.	Increase.	Gone to live in Denver, where engaged actively in business; is still improving, though very reckless.
Cure.	Gain.	Cleared up entirely.	Increase.	Lives mostly on ranch; has been on visit to England; returned very well.
Cure.	Gain.	Cleared up.	Increase.	Is very well; lives here and works, but goes East on visits.
Much improved.	Less.	Lung cleared except at extreme apex.	Increase.	Lives here; does well, except when working too hard in office; removal of nasal exostosis with much relief.
Improved.	Less.	Right lung partly cleared; cavities in left contracting.	1 inch increase.	Spent two winters here, summers in Scotland, to which he returned; was stronger when seen last May.
Improved.	Gain.	Much improved; lung clearing slowly.	Increase.	Lives and works here; feels and looks strong.
Cure.	Gain.	All signs disappeared.	Increase.	Returned to New England strong and hearty; has continued well.
Much improved.	Gain.	At first extension and consolidation at right apex, then clearing up of both.	Increase.	Went to Europe; was very strong and hearty when he left; lungs since pronounced well.
Greatly improved.	Gain.	Most of consolidation cleared up and throat improved.	1 inch increase.	Lives in Pueblo; works all day in office; has gained in general vigor and in voice.
Cure.	Gain.	Chest cleared up entirely.	Increase.	Lives here; feels well and strong; actively at work.
Greatly improved.	Less.	Some clearing up of both sides, with fibroid contraction on right.	Increase.	Gone to England for summer, to return in fall; greatly gained in strength; seen in England; doing well.
Improving	Gain.	Small cavity formed in right, which is now contracting; left clearing.	Increase.	Remains here; is tending to improve; disease not fully arrested; general condition good.
Improving	Gain.	Cavity tending to contract; left side cleared up.	Increase.	Lives here; works, feels and looks much stronger.
Cured.	Gain.	All symptoms disappeared.	Increase.	Lives in Denver; looks and feels strong.
Much improved.	Gain.	Consolidation partly cleared, leaving fibrosis of both apices.	Increase.	Went to live on ranch after spending summer in Scotland; strong and well except for rheumatism.
Death.	Less.	Breaking down of both lungs; diarrhoea; heart failure.	Nil.	In first six weeks temporary improvement.
Death.	Less.	Breaking down of right lung; fever; heart failure.	Nil.	First month, less fever, temporary benefit.
Death.	Less.	Breaking down <i>en masse</i> in left; extension in right.	Nil.	Went to bed on arrival, and never strong enough to dress and leave room.
Death.	Less.	Improved very much; lung clearing; went East and returned with breaking down and cardiac dilatation.	Nil.	When leaving for home, after a year, was strong and fat, and lung was clearing; returned after two months with breaking down and cardiac dilatation; died from hemorrhage.

No.	Name.	Sex.	Age	Date of 1st Visit.	Nature and Extent of Disease.	L'gth of Illness before coming to Col.	Family Pre-disposition.	Hæmoptysis.	Length of Residence.
121	E. H.	F.	36	1884, Jan. 24.	Both. Third, right upper; second, left lower and first right apex; fever; night sweats; tubercular laryngitis; very weak.	2 years.	Mat. G. mother, 1 aunt.	Slight; none since.	2 mos.
122	T. R.	M.	27	Feb. 4.	Both. Second, both upper lobes; fever; night sweats; weak.	2 years.	None.	Slight; none since.	7½ mos.
123	L. B.	F.	35	June 7.	Both. Third, upper left; second, right; tubercular laryngitis; fever; night sweats; very weak.	2½ yrs.	1 uncle.	None.	3 mos.
124	W. J.	M.	43	July 22.	Both. Third, left upper; second, right upper; fever; night sweats; asthma; cardiac dilatation; weak.	2½ yrs.	1 sister.	None.	3 mos.
125	H. H.	M.	30	1884, Sept. 2.	One. First, right upper; tubercular laryngitis; night sweats; fever; fair strength.	8 mos.	Mother.	None.	1 year.
126	S. H.	M.	32	Oct. 2.	Both. Third, right upper; first, left apex; caries of iliac bone; fever; night sweats; weak.	3½ yrs.	Mother.	None.	4 mos.
127	B. S.	M.	23	Oct. 17.	Both. First, both apices; most at right; chronic laryngitis; no fever; fair strength.	1 year.	Father, pat. G. father.	None.	7 mos.
128	W. H.	M.	36	Nov. 3.	One. Second, left lower; first, left upper; no fever; marked anorexia; weak heart; poor condition.	1 year.	None.	None.	3 mos.
129	S. D.	F.	28	Nov. 4.	Both. Second, left upper and right apex; no fever.	2 years.	Mother, mat. G. M.	Slight; none since.	10 mos.
130	E. P.	M.	40	Nov. 26.	Both. Second, upper left; first, right apex; tubercular laryngitis; anal ulcers; fever; weak.	10 mos.	None.	Slight; none since.	9 mos.
131	W. G.	M.	38	1885, Jan. 16.	One. Second, right upper; slight fever.	6 years.	1 uncle.	Several severe; none since.	1½ yrs.
132	J. C.	M.	42	Jan. 17.	One. First, left upper; no fever; anal fistula; dyspepsia; fair condition.	2 years.	None.	Several slight; few slight since.	2 years.
133	A. B.	M.	32	April 6.	One. Second, right upper; slight fever; anaemic.	1½ yrs.	1 uncle, 2 sisters.	Slight; none since.	2½ yrs.
134	E. A.	F.	26	Jan. 10.	One. Second, left upper and lower; much bronchitis; chronic laryngitis; fair flesh and strength.	2 years.	None.	None.	1 year.
135	J. C.	M.	20	July 23.	Both. Third, left apex; small cavity; second, right apex; fever; sweats; tubercular laryngitis; very weak.	1½ yrs.	2 brothers.	Slight; none since.	4 mos.
136	F. H.	F.	17	Aug. 13.	One. Second, left apex; fever; fair strength.	4 mos.	Mother, tubercular meningitis.	Slight; none since.	8½ mos.
137	L. P.	M.	26	1884, Oct. 24.	Both. Second, left upper; first, right apex; fever; sweats; dyspepsia; weak.	3 years.	Mother.	Several slight; none since.	1 year.
138	T. W.	M.	24	1886, Sept. 14.	Both. Third, left upper; large cavity; first, right lower; fever; sweats; dyspepsia; weak.	14 mos.	Mother, 1 aunt, 1 uncle.	Slight; none since.	2½ yrs.
139	W. W.	M.	26	Oct. 1.	Both. Second, right upper; first, left upper; fever; sweats; weak.	1½ yrs.	None.	Several severe; none since.	4 mos.
140	A. R.	F.	34	Oct. 20.	Both. Second, left upper; second, right apex; fever; sweats; dyspepsia; very weak.	3 years.	None.	None.	5 mos.
141	J. S.	M.	33	— 20.	Both. Third, right apex, old cavity; one forming at right base; first, left apex, fever; weak.	4½ yrs.	None.	None.	13 mos.

General Result.	Weight.	Local Result.	Chest Circumference.	Notes.
Death.	Less.	Softening of lungs and larynx.	Nil.	Rapid deterioration; went home; died a month later.
Death.	Less.	Rapid softening at last.	Nil.	First four months decided tendency toward arrest; went down rapidly at last; hard drinker; very careless.
Death.	Less.	Cavity formed in left; breaking down began in right laryngitis; worse.	Nil.	Slight improvement first six weeks; then rapid deterioration; sent home; died month later.
Death.	Less.	Rapid and steady deterioration.	Nil.	No check to downward progress.
Death.	Gain.	Extension of disease first few months; then arrest in lung and throat, and relapse after leaving Colorado.	Increase.	He got very strong; laryngeal ulcers healed; lungs partly cleared; went East September 6, 1885; died of tubercular meningitis six months later.
Death.	Less.	Deterioration progressed rapidly.	Nil.	Went home and died two months later.
Death.	Less.	Improvement first four months; then rapid extension and softening.	Nil.	Went home and died in six weeks.
Death.	Less.	Breaking down of left upper lobe; extension in right.	Nil.	Had been hard drinker; no improvement; died with heart failure.
Death.	Less.	Slow, continuous extension of softening.	Increase.	No improvement; had strumous glands; brought up chalk stones.
Death.	Less.	First five months laryngeal ulcers healed and lungs improved; then softening of both.	Increase.	Went to England and died six months later.
Death.	Less.	Cavity formed in right, and extension in left.	Nil.	Never improved.
Death.	Less.	Up to April, 1887, some clearing up below and fibrosis above; on second visit fibrosis extended through lung.	Increase.	Was improving till April, 1887; went to Australia; returned in eight months worse; dyspepsia; ran down, left in Spring of 1888; died year later; free drinker.
Death.	Less.	Some drying and clearing in first year; then large cavity formed.	Increase.	Never any real arrest to the disease; was careful of himself and lived out-of-doors.
Death.	Less.	General breaking down in left lung, and pneumonia at right apex.	Increase.	The case was one where bronchitis was the prominent symptom; it progressed without check; death one year after leaving.
Death.	Less.	Breaking down of both apices; extension below; no check.	Nil.	Deterioration rapid and progressive; went home; died in six weeks.
Death.	Gain.	There was marked improvement in chest; râles becoming dry.	Increase.	The general health, as well as the lung, greatly improved, but tubercular meningitis came on forty-eight hours before death.
Death.	Less.	Large cavity formed in left and small in right; no check.	Nil.	Steady decline.
Death.	Less.	Extension of cavity; tuberculosis through left lower lobe and right upper.	Increase.	First ten months marked improvement in general health and no local advance; went East; returned with signs in right lung and then declined.
Death.	Slight gain.	When leaving cavity forming in right; left improving.	Increase.	While here some general improvement and fever ceased; went to Arizona and died in a year.
Death.	Less.	Excavation in left and breaking down beginning in right.	Nil.	Slight general improvement in first two months, but steady advance in local disease and loss of strength.
Death.	Less.	Large cavity formed at right base.	Nil.	Quite an improvement in general health up to four months before death.

DISCUSSION.

Dr. F. I. Knight.—The papers are exactly what we want. These gentlemen who are living in this locality are, of course, the ones who are especially able to offer us these facts, and it is facts that we need, facts that enable us to discriminate in practice, which will make us differ as specialists from the ordinary routine of the family practitioner; and every year that we accumulate these facts in regard to the particulars of the climate, and in regard to the results of the treatment by climate which Dr. Solly has given us here, the exact results, the more we approximate a definite, scientific knowledge, a knowledge which will be respected by the community. Already, I think, we have gained in the profession a good standing. The American Climatological Association is respected by the profession in general; and I think the community, when it comes to know the work done here, will also appreciate it. We want to discriminate in the climate and in the individual who is to be put under its conditions. Now one of the gentlemen said this morning that there are many consumptive patients which high altitude does not cure. That is very true, but as a rule, I venture to say that those patients ought not to have been sent into high altitude; that we will learn to advise such patients to go to lower altitudes where they can get similar conditions. I hope this work will go on, so that we shall be enabled from our results to say, Do not spend your winter in Denver, but go down to some other place, and go back to Denver for the summer, and so on. Many patients are willing and glad to have a change, and should not be obliged to stay forever in Colorado Springs, but can spend a year or a part of it pleasantly in a different location. And I feel sure that this work will go on, and that it will put us in a very enviable position.

Dr. E. Fletcher Ingals.—I think that the comparison of the cases of the author with those of Dr. Williams is of little value because of the great difference of the character of the patients. The author has certainly selected his cases as nearly properly as he could, and I think he is greatly to be commended for it.

The paper is one of great value to us. It is unfortunate, however, that he has followed so closely the plan adopted by Dr. Williams in classing together all cases in the second and third stages of the disease. Those of the first stage did remarkably well in this climate ; those in the second and third stages also did well, but I do not know how many of them were of the third stage and how many were of the second. It has been my belief, and it is commonly accepted, that in the third stage of the disease patients do not do well in a high altitude, and therefore, unless the author can correct this part of the classification, he robs the paper of much of its value, at least to me.

Dr. Solly.—I might mention that when the paper is published I do report the cases separately, but in the gross results I thought it better to follow the suggestion of Dr. Williams.

Dr. Ingals.—There is another defect in the paper which, I think, can be remedied, and which will add to its value. The doctor has unfortunately classed all his patients as residents of Colorado living in a high altitude. Now, with physicians in Colorado this is a good classification, and I have no doubt eminently satisfactory, but physicians outside of the State are liable to think that the doctor wants all patients sent to Colorado, and they will give less credence to his paper than they would if, instead of classing them as patients treated in Colorado, he would simply state that they were treated in a high altitude.

Dr. S. A. Fisk, of Denver.—Mention has been made of a series of 100 cases which I had the pleasure of presenting to the Colorado State Medical Society, in this very hall, somewhat over a year ago. I tried to observe the same conscientiousness in the selection of my cases that Dr. Solly has in his, having reference to my being able to follow them and to speak with knowledge of each individual case, and putting out of the consideration as far as possible, the personal equation, which must always come into the compilation of statistics. I won't attempt to go over the ground again. Sixty-seven per cent of the cases that are sent to Colorado can fairly expect improvement.

With reference to patients that ought to be sent to Colorado, the gentleman from Boston, Dr. Knight, has been exceptionally fortunate in the selection of cases. It seems to me

that he takes into consideration the point which we here recognize as of great importance, being that of a recuperative power, as shown by the ability to eat and assimilate. A prime factor with reference to climatic treatment of phthisis, whether it be in this climate or anywhere else, is the ability of the patient to be out of doors, as enabling him to improve his nutrition. Now we have a climate here in Colorado that admits of a great deal of out-door life in the winter time, and that is the important time to consider. Even in mid-winter the days are so warm that it is possible for the patient to be out of doors nearly every day. At mid-day we have a temperature ranging from 62 degrees upward, so that the most of us go without overcoats. The sun rises very early here—about seven o'clock in the morning ; it strikes the dry soil and warms up the air. When it is time for the patient to go out of doors, about nine or ten o'clock in the morning, he finds the air warm and agreeable. Sunshine is another element. We have 320 days of sunshine out of 365. The number of hours each day that the patient can be out of doors compared with other high altitudes, I think, is nearly two to one.

It is like a patient tumbling out of bed into a cold atmosphere in his room, or having a fire built there first. I mention these points because they enable the patient to live out of doors. The prime principle laid down with reference to climatic treatment is that out-of-door life improves the nutrition. This is a prime factor. One reason why better results are not obtained with reference to climatic treatment of disease here, as well as elsewhere, I presume is the fact that the question of exercise cannot be properly regulated. It is one of the most difficult questions to regulate that the doctor has to meet. It cannot be laid down as an invariable rule that consumptive patients should take violent exercise. There are those who advocate rest. In each individual case it is a nice point to determine. In my 100 cases I found something like 25 per cent of deaths. Looking over this 25 per cent of deaths, I find that there were patients who had every reason to expect very marked improvement, and who were gaining and doing admirably well up to a certain point, when they committed an imprudence which turned the scale. I have in mind a case, probably well known to some of you, who was doing admirably well until he

took a long horseback ride. He rode 20 miles hard with a companion who was a strong man. When he came in he had a hemorrhage, and instead of keeping quiet, he was imprudent, and his hemorrhages went from bad to worse. He had rapid and profuse hemorrhages, and he never rallied. I have in mind another case, of a young man who could have been classed as almost, if not quite cured, when he took part in a negro minstrel show, contracted pneumonia and died. Such cases are frequent here. Every one who has practised in Colorado knows how hard it is to regulate the conduct of the patient. Now, for my part, where the patients come here from the East, I insist, no matter what the stage of the disease, that they shall be kept quiet at first. They come from a sea-level to an altitude one mile above the sea-level, from an atmospheric pressure of 15 pounds to the square inch to one of $12\frac{1}{2}$.

The burden of my advice to them is : Rest ; keep quiet ; there is no hurry about seeing Denver ; sit in the sun and breathe the fresh air and get your sleep regularly. Then, after a month of quiet, I let them exercise a little, but keep them moderately quiet for several months ; not until later on do they begin to climb mountains. It seems to me that where there is much progress of the disease as shown by an elevated temperature in the afternoon, patients, no matter how long they have been here, should be kept quiet. I frequently put my patients absolutely at rest in bed and keep them there until I get control of the temperature.

With reference to the several stages of the disease, in the selection of the cases to be sent out here, while in general terms I would agree with Dr. Ingals, that persons in the third stage should not be sent, yet I would take into consideration probably more than that the recuperative power of the individual as shown by his ability to eat and digest, and the absence of fever, because I suppose we all are agreed that the high altitude is not suited to acute conditions. I have in mind a great many patients who have come here with cavities, but who had recuperative power, who could eat well, and whose stomachs never troubled them, who could sleep well, and who have done admirably well. I have in mind now a gentleman living out on a ranch. If you could see him, you would con-

sider him one of the healthiest specimens in the whole State. He is conducting a large ranch, but has quite a cavity in one lung. He is good for many years yet. He goes back to England (his home) occasionally, and I think he is a fair illustration that patients even in the third stage may be sent here, provided they have recuperative power. I have seen persons in the earliest stage go down very rapidly, nervous women who cannot retain food sink rapidly and pass away in a few months, while other persons with cavities, who eat and digest, and can be out of doors, have gotten well.

Dr. Bowditch.—This brings to my mind very forcibly the question of sanitariums. Dr. Fisk speaks of the frequent possibility of the patient committing indiscretions which put him back months in the progress toward recovery. I do not know the feeling of the physicians here, but I have noticed a tendency in the direction of founding sanitariums for the proper supervision of patients. I feel that the chief thing is the proper supervision of those who come here for climatic treatment, and I sincerely trust that as time goes on institutions of this sort will become common here.

Dr. Curtin.—Dr. Fisk's suggestions are good indeed, but what about the life and health of the children of consumptive patients in Colorado?

Dr. Solly.—I have not any statistics on that point, but having lived here sixteen years, I have seen children of consumptive parents grow up, many of them in Colorado Springs, and it is a rare thing to see an unhealthy child among them. They are, for the most part, remarkably healthy. The parents of the children are often both consumptives, because there have been many marriages between consumptives there. I attribute their good health to the open air life they are able to lead.

Dr. Denison.—We are grateful to Dr. Solly for his presentation of the record of cases. No one knows better than he who has tried to record the cases which he has had for a given space of time, how difficult it is. I know when I had 205 cases, which I tried to record and bring to mind so I could state the present condition and give a fair statement of just how the cases resulted, seven cases at a time was all I could manage. We appreciate the value of the statistics thus given to us. They will add materially to the records that have been presented heretofore, as will also Dr. Fisk's.

NERVOUS AND MENTAL DISEASES OBSERVED IN COLORADO.

By J. T. ESKRIDGE, M.D., Denver, Col., formerly Post-Graduate Instructor in Nervous Diseases in the Jefferson Medical College and Physician to the Hospital of the College, etc.

IN a communication to the Philadelphia Neurological Society, in September, 1887, I gave the results of three years' observation of the climate of Colorado on nervous and mental diseases, together with the views of several physicians in various portions of the State, practising at altitudes varying from 4000 to 10,000 feet. In the present paper I can add three years' additional observations on the same subject. Two years of this time have been spent in Denver, where the field of observation has been much enlarged, owing to the size of the city and the hospital accommodations, which have enabled me to study cases from nearly every portion of the State.

In my former paper I stated that "among the inhabitants of Colorado we find more leisure in many places and a greater tendency to keep late hours and indulge in various dissipations than is common farther East. Many go to Colorado in search of health, and the separation from relatives and friends, added to the enforced idleness, is a source of worry and a certain amount of nervousness. Some go to better their fortunes, and, for these, investments in mines and various other uncertain speculations cause anxiety and unwonted excitement. Many who had lived quiet lives and kept regular hours for rest and eating in the Eastern States go to Colorado, overindulge in the use of alcohol and tobacco, and try their nervous systems by late and irregular hours. After allowing for all the modifying influences, exclusive of climate, I feel confident that by a careful comparison of certain nervous disturbances at sea-level with those of like nature met with in high and dry mountainous regions a difference will be found to exist; but the difference is much less than the exaggerated statements made by the laity here concerning the influence of Colorado climate on the nervous system would at first lead us to be-

lieve. That among the people of Colorado we have more of what is termed nervousness than exists in the same number of inhabitants at sea-level there can be no doubt, but consumptive invalids form a greater proportion of the population in Colorado than is found farther East."

Most of the statements just quoted hold good to-day in certain portions of Colorado, especially in Colorado Springs, where I resided when the observations were made. In Denver, where I have made my observations during the past two years, there are less idleness and fewer consumptives in proportion to the population, but more business worry and bustle, and probably more irregular living, than in places like Colorado Springs and Manitou, where a greater proportion of the inhabitants have gone more for health than for business. If we take the people of Denver and compare them with a similar number in one of the wide-awake and business-going cities of the East, such as New York or Chicago, we shall find their habits and methods of doing business so nearly alike that but little difference in influence on the nervous system, except climatal, will be found to exist in Denver that is not active in the Eastern cities.

Most of my observations on the influence of Colorado climate on the nervous system have not been conducted by strictly scientific methods, but rather by comparing clinical observations made in Colorado with those made in Philadelphia, extending over a number of years. It must be borne in mind that conclusions reached by this method are distorted more or less by personal equation, the degree of inaccuracy depending largely upon the carefulness and faithfulness of the observer. A few facts, however, have been ascertained by strictly scientific procedure. While practising in Philadelphia I devoted considerable time to surface-temperature observation, both in health and in disease. The number of observations amounted to several thousands, taken over various portions of the body. During the last four or five years I have continued these observations in Colorado, limiting the area mainly, but not exclusively, to the surface of the head. After allowing for changes in the mercurial thermometers, which time invariably effects, I find that the normal head temperature in Colorado is about half a degree (F.) higher than in Philadelphia.

I have also endeavored to compare the surface temperature of the body at various altitudes, but observations made at high altitudes, especially on Pike's Peak, owing to danger to my health in ascending high mountains, had to be intrusted to others, and I fear have but little value. No one unaccustomed to making surface temperature observations realizes the amount of care necessary to prevent inaccuracies. Time and time again I have requested my assistants to make such temperature observations for me, and I have repeated the observations a few minutes later and have gotten different results, the difference varying from a quarter of a degree to a degree.

Increased surface temperature in Colorado is what most clinical observers had inferred long before my observations, but the supposed condition, scientifically confirmed, becomes a fact and may help to explain many modifying influences the climate has on the functions of the organs of the body.

Mental Work.—I have often asked myself the question, and not infrequently propounded the query to others, whether a person is able to do more or less mental work in Colorado than at sea-level. The kind of mental work I refer to is hard study for several hours each day, continued over several weeks. The answer I have obtained from most persons whom I have interrogated on this subject is that they have not compared the effects and were undecided as to the results. I have tried to compare the effects on my own person, as I gave a few hours each day to hard mental work for many consecutive weeks in each year while practising in Philadelphia, and much of the time since coming to Colorado, when my health would permit of it. I have devoted more or less time each day to mental work. I feel that the conclusions at which I have arrived from personal experience may be open to objection. My physical power of endurance is much lessened since I contracted lung trouble, for which I came to Colorado, and, in consequence, mental effort sooner results in fatigue. I have found that three or four hours each day devoted to continuous mental work and extended over a period of a few weeks so weakens and prostrates me that I am compelled to give up all reading, except light literature, for a time. When I have felt fresh and have had a zest for study, I have thought I could accomplish more in a given time than I was able to do at a low

altitude ; but this is merely surmise on my part. The only persons who can approximate an accurate solution of this subject are those who, in good health, accustomed to do a regular amount of study East, have come to Colorado in the same state of health to pursue similar studies to those engaged in while East.

Sleep and Insomnia.—Under this heading in my former paper, the unanimous opinion of the physicians was that sleep was more easily obtained, more continuous, and more refreshing in Colorado than at sea-level. We have several classes in which to study the effects of the climate on the production of sleep, or as a cause of insomnia. Among these may be mentioned the tourist, including the business adventurer ; the tired and over-worked, both mentally and physically ; and the health-seeker, especially the consumptive person.

On tourists or adventurers the effects are as varied as the temperaments of the individuals, and are modified by the habits and life of such persons while in Colorado. The restless ones among this class, who are never satisfied, but must have continuous excitement in scenery or some other diversion, rarely get good and refreshing sleep in Colorado unless tired out by physical exhaustion, when they run the risk of developing a temporary irritable heart, disturbances in digestion, and headache. Such persons frequently leave the State complaining bitterly of the evil effects of the climate on healthy individuals.

Those of this class who take things leisurely, more as a natural result of their temperaments than from the warnings of others who have been indiscreet, do not over-exercise, and allow themselves time for regular meals and rest, rarely fail to get prolonged and refreshing sleep.

About the only practical deductions to be derived from a study of the experiences of the tourists in Colorado are what to avoid in the invalid class.

The Overworked.—In this class are included the tired business and professional man, whose mental strain compels sedentary habits, neglect of proper exercise, and irregular hours for eating and sleeping, and the lady of family cares, as well as she whose vigor has been sapped by the unreasonable exactions of fashionable life. To these a visit to Colorado means, in

the majority of cases, if too much physical exercise is not indulged in, prolonged and refreshing sleep. Such persons coming here from the East regain their strength rapidly ; but we must not attribute all the good results to Colorado climate. Habits and modes of living for the time being are changed. The business man leaves worry and care behind ; the professional man, relieved of the trials, annoyances, and anxious cares of his profession, seeks rest amid new scenes, while she who had been sore pressed with family cares and social obligations changes these for a quiet life. Much of the relief comes from "the change," irrespective of climate.

Having had an opportunity for a number of years, before coming to Colorado, of studying the effect of sea-shore resorts on this class of persons, I found a greater proportion unrelieved from insomnia than I find to be the case with those who seek rest and change among the mountains of Colorado, provided that a sufficiently quiet life is led here. According to the writer's experience, it is a rare exception for insomnia to continue in such persons after coming to Colorado, excluding a few cases of supposed active hyperæmia of the brain or irritable heart, reference to which will be made later.

Health-seekers.—I have found no reasons for changing the statements that I made three years ago : "That for the majority of persons, especially for the consumptive invalids, sleep is more easily obtained, more continuous, and more refreshing in Colorado than in the Eastern States. The tired, ill-nourished, and overworked person, who spent sleepless nights East, goes to Colorado and finds, as his nutrition improves, that sleep is prolonged and unusually refreshing. Cool nights throughout the summer season, as a rule, enable persons to get much more sleep and rest in Colorado than can be obtained at sea-level during this portion of the year. Some, on going to Colorado, are unable to sleep well for a few nights, or perhaps weeks, while others get prolonged and refreshing sleep from the first. Those belonging to the latter group are much the more numerous. Those whose sleep is disturbed on first going to places of considerable altitude usually enjoy a sufficient amount of sleep for several months after they begin to rest well, but I doubt whether these are ever able to sleep as much as those who rest well on first going to high mountain-

ous regions. There is a popular and almost universal belief among the laity, and physicians share this opinion, that one wears out the good effects of the climate after a few years' continuous residence in Colorado. I am firmly convinced, both from observations and from inquiries among those who have resided here a considerable length of time, that there is a great deal of truth in this prevailing opinion. Those who lead idle or sedentary lives are, I think, more liable to become sleepless after a considerable stay here than those who keep profitably employed in work that requires more or less exercise. Much severe mental work at high altitudes would be, I think, more likely to be followed by sleeplessness than the same done at sea-level. Tobacco, alcohol, tea, and coffee, if indulged in immoderately, apparently injuriously affect sleep more at high altitudes than the same indiscretions do at low elevations."

While the majority of persons who come to Colorado get refreshing sleep for a number of months, and in some instances for years, yet there are a few nervous, hysterical individuals who find great difficulty in getting refreshing sleep here. They are not able to sleep a sufficient number of hours, and the time for repose is frequently spent in broken sleep. Cases of insomnia in the East, due to active hyperæmia of the brain that is not relieved by rest, sleep poorly, I think, in Colorado. At least this has been my experience with cases of the kind. Dr. Anderson, of Colorado Springs, and Dr. Sears, of Leadville, both say that cases of cerebral hyperæmia sleep well at each of the last-named places. I am inclined to believe that they have not distinguished, in their communications to me, between active and passive hyperæmia. I am led to believe, from observations, that cases of passive hyperæmia, or venous stasis of the brain, due to mental overwork, worry, loss of sleep, etc., are able to obtain abundant and refreshing sleep. I believe also that insomnia due to organic brain changes or active hyperæmia is made worse in Colorado. In my former paper I stated that "it is very difficult to say whether medium (4000 to 6000 feet) elevations, or the higher (7000 to 11,000 feet), are the better for cases of insomnia." During the last three years I have known of a few persons who have come to the medium elevations, slept well for a time, then, becoming

more or less sleepless, have gone to the higher altitudes, where they again slept well. I think such cases are rare. But, on the contrary, we frequently find that persons who become troubled with insomnia in the higher altitudes, where they had slept fairly well for a length of time, coming to the medium elevations of Colorado obtain refreshing and prolonged sleep. Pure air, good weather, and the amount of bright sunshine, even in winter, inviting persons to live outdoors a good portion of the time and take more exercise than they were accustomed to do East, are important agents in enabling one to get refreshing sleep in Colorado. What lessened atmospheric pressure has to do with inducing sleep, making it more profound, as some who reside in very high altitudes maintain, has yet to be determined. Those who have had experience with the pneumatic cabinet, and have noted the sensations experienced by their patients, may be able to enlighten us on this subject.

Irritable Nervous System, or Nervousness.—The opinions of the physicians of Colorado differ widely respecting the influence of the climate on a delicate and irritable nervous system, some believing the influence is great, and others that it is slight, if any exists.

An additional three years' experience with nervous affections found in Colorado enables me to emphasize what I said on this subject three years ago : " From what I have learned from observations and inquiry, I have no hesitation in saying that the inherent nervous temperaments—not those who are nervous from malnutrition, which the climate may and does remove in many instances—are made worse by a prolonged residence in Colorado. Further, I believe, and I think I am expressing the opinions of a number of physicians there, that many who are not usually considered nervous become so after a prolonged residence in Colorado." The nervousness may manifest itself by sleeplessness, irritable heart, with a tendency to passive congestion, especially of the gastro-intestinal mucous membrane, by a loss of appetite, failure of strength, lessened power of endurance, and considerable loss in body weight. Some suffer from restlessness and irritability of temper, and some complain of inability to concentrate the mind long on any subject. Persons thus affected and contemplating making

their home in Colorado should not try to overcome their sensations by a prolonged and uninterrupted stay here, but they should try to spend a month or two each year at sea-level, which is almost invariably followed by an improved condition of the nervous symptoms.

Dr. Reed, of Colorado Springs, informed me that he had observed that child-bearing nervous women, after a prolonged stay in Colorado, recover less satisfactorily from the trying ordeals of the lying-in room after the birth of the second or third child than they had done after the first. The intensely bright sunshine, and the great amount of it, which is the boast of Coloradians, the dry atmosphere, and the winds, it seems to me, are factors in irritating an already irritable nervous system. Some have tried to lay the cause at the door of lessened atmospheric pressure. This may have something to do with it, but how much it is impossible to say.

Before beginning this paper I was informed that Dr. H. A. Lemen, who has practised medicine in Colorado for a number of years and paid especial attention to diseases of women, would write on the influence of climate on women. I regret that his engagements have been such that he has been unable to contribute a paper on this subject. That the nervous system of woman is more irritable than that of man every one will admit, and that she in consequence suffers more from the irritating effects of our climate is self-evident. My note-book shows that a large percentage of those who suffer from the irritating effects of this climate is composed of women; but I will not go into details, hoping that Dr. Lemen, at some future time, will take up this subject and elaborate it.

Hysteria.—Three years ago I was able to give the results of the experience of various physicians with this protean disease as it occurs in the smaller towns in the State, and of my observations of it in Colorado Springs. My conclusions were then that it was of lighter form, shorter duration, and much less frequent in proportion to the population than observed in the large Eastern cities, but at the same time I endeavored to account for the infrequency from the habits of the people and their surroundings, and expressed an opinion that had we in Colorado all the conditions of a large Eastern city favorable for the development of hysteria, it would be found more fre-

quent here than it is in cities at sea-level. Two years' experience in Denver, where conditions favoring the development and manifestation of the disease exist, convinces me that hysteria is not infrequent here, and that it is found in all forms, from the mildest to the severest. I have witnessed three cases in the male. From my present experience I am unable to say that the disease is of shorter duration and yields more readily to treatment than is found in the eastern portion of this country.

Chronic Alcoholism and the Opium Habit.—What must impress itself on every observer in Denver is the immense number suffering from the chronic effects of alcohol and opium. Other causes than climatal may account for this. A large proportion of those whom I have had an opportunity to interrogate on this subject admit having been addicted to the habit before coming to Colorado. Denver during the last few years has been the Mecca sought by those broken down financially, and in this class alcoholism and the opium habit are common. Whether there is anything in the climate of Colorado tending to indulgence in alcohol and opium more than what is found at sea-level I am unable to say. Whether a larger proportion of the population here has begun the over-use of alcohol, or contracted the opium habit, in Colorado, than is found at sea-level, many years of carefully studied statistics must answer.

Chorea.—The physicians who favored me with their experiences with chorea three years ago were almost unanimous in their opinions that the disease is more frequent, severer, of longer duration, and less amenable to treatment in Colorado than at sea-level. I then expressed the opinion, from an experience with the disease in Colorado Springs, that it was unfavorably influenced by the climate.

Some of the physicians who were kind enough to answer my inquiries stated that they invariably sent all their cases of chorea to lower altitudes, with decided benefit to their patients.

During the past three years I have had the opportunity of treating and seeing in consultation numerous cases of chorea in Denver. So far, without a single exception, they have yielded to the ordinary treatment for this disease. Some cases have

developed at low altitudes, and from force of circumstances have been brought to this city. These have yielded to treatment, but in one case the movements at first seemed to be exaggerated by the change to this altitude. My treatment has invariably been, in cases where the choreic movements were great, full doses of antipyrine or phenacetin until the movements had nearly ceased, when Fowler's solution of arsenic has been carried to the point of toleration, the dose reached in some cases being eighteen or twenty drops thrice daily. My former statements will have to be modified by saying that chorea at this altitude (about 5000 feet) seems to yield about as readily as at sea-level, and with no greater tendency to relapses.

Neuralgia.—A more extended experience convinces me that neuralgia is a much less troublesome and less frequent disease in Colorado than in low malarial districts. I have seen several cases of malarial neuralgia rapidly yield after coming to Colorado.

Migraine seems to be favorably modified on first coming to Colorado, but the attacks are not broken up, and, after a few months, the trouble returns and seems to be more persistent than it was at low altitudes.

In some of these sufferers, upon a return to a low altitude after they had spent some months in Colorado, long intervals with entire freedom from the disease have resulted.

Multiple Neuritis.—During the last six months I have seen six cases of this disease. So far I have been unable to discover any points of difference between the course, severity, and duration of the disease here and at low altitudes.

Epilepsy.—In my former communication the answers of the physicians in reply to my inquiries concerning the influence of the climate on epilepsy varied so greatly that no conclusion could be arrived at; some believed that the disease was unfavorably influenced by a resort to this climate, that it quite frequently originated here and proved rebellious to treatment; others thought it was uninfluenced by the climate, while some thought it was a very infrequent disease in Colorado.

I have had an opportunity of personally studying twenty-one cases of epilepsy since coming to Colorado. Sixteen of the twenty-one originated at low altitudes outside of Colorado,

leaving five cases which began in some portion of the State. Of the Colorado group, the age at which the disease began was at the second, third, fourth, seventh, and thirtieth year, respectively. Of the imported cases, three began at the second, two at the fourth, six at the tenth, three at the sixteenth, one at the thirty-third, and one at the thirty-seventh year.

Causes.—Of the Colorado group, in one, injury to head from a fall; in one, hydrocephalus, and in three the cause is unknown. Of the imported cases, gastro-intestinal disturbances in infancy seemed to be the exciting cause in four, injury to head in five, and unknown in eight.

Sex.—Colorado group, three males, two females. Imported cases, there were fifteen males and one female.

Severe or Light Attacks.—In the Colorado cases three suffered only from the light or *petit mal*, and in two the *grand* and *petit mal* were found. In the imported cases all suffered from the severer manifestations of the disease, although a few also had occasional *petit-mal* attacks.

Time.—Of the Colorado cases, in one the seizures were limited to the waking hours, and in the other four they occurred both diurnally and nocturnally. Of the imported cases, in only one were the seizures of the diurnal character, and in the other fifteen the attacks occurred indifferently both day and night. So far I have not seen a case of epilepsy in Colorado in which the attacks were limited to the sleeping hours.*

Mental Effect.—Of the Colorado cases, there is decided mental failure in three, and in two the mind seems unaffected. Of the imported cases, insanity has developed in four and mental failure in ten, and in two the mind seems well preserved. In all of the Colorado cases treatment has seemed to be attended with the usual results found at low altitudes. The result of the climate on the sixteen imported patients is hard to determine. Two were excitable and unmanageable at times before coming to Colorado. These were soon decided to be insane after coming to this State, and one has since died in a condition of *status epilepticus*. On the fourteen others the climate had no appreciable effect. It will be observed that only one female epileptic is found among the

* Since this was written, a case of epilepsy with attacks only in the early morning hours (four or five o'clock) has come under my observation.

sixteen coming from a distance to Colorado. This is accounted for from the fact that female epileptics rarely leave home. I have been unable to perceive that the climate of Colorado, especially at Denver, materially modifies the course of epilepsy, except, it may be, for a short time after the arrival of such patients here, when the disease is frequently benefited if the person keeps sufficiently quiet.

Insanity.—Since coming to Denver I find it even more difficult to determine the influence of Colorado climate on the insane and in the causation of insanity than I did while practising in Colorado Springs. Of the one hundred cases of insanity of which I have records of having seen during the past year in this city, about fifty per cent were insane before coming to Colorado, and ten of the remaining fifty became insane in other portions of Colorado than Denver. During June of the present year I saw nine cases of insanity, six of which, so far as could be learned, developed in Colorado, but only four of these in Denver. From the 1st to the 19th of August I saw sixteen cases, only seven of which developed in Colorado. In July I saw six cases, three of which developed in Colorado and three outside the State.

This State has not as yet made adequate provision for the care of her insane, and some of the adjoining States and Territories are behind Colorado in caring for their insane, and, in consequence, there is a small insane nomadic population that travel from State to State and from city to city, as they can succeed in obtaining from county commissioners free transportation. As jury trials are expensive to adjudge persons of unsound mind insane, it sometimes happens that the cheapest way to get rid of such persons is to send them to an adjoining county or State.

Until Colorado succeeds in establishing ample accommodation for her insane, and until we can get the records of every case of insanity developing in the State and leaving it, it will be impossible to ascertain our insane population. It is evident that the proportion of our insane population in this State is rapidly increasing, but how fast statistics give us no idea.

Some patients with insanity, especially of the maniacal form, are benefited on being removed to a lower altitude. The number of cases of insanity developing in Colorado and

taking a depressive form far outnumber those of an expansive nature. As yet there is no private asylum in the State where the insane with means to defray their own expenses can be cared for, and in consequence all such are sent to Eastern asylums.

Temporary Effects of High Altitudes.—Many go to the summit of high mountains and experience no inconvenience, while others at times can perform such feats with impunity, but at other times, depending probably upon the condition of their health, find mental or physical symptoms are produced thereby, and yet a third class is almost invariably inconvenienced by high altitudes. The following case reported in a former paper is to the point : "An intelligent young man, a tutor, in excellent health, started from Manitou early one morning in June, 1887, to go on horseback to the summit of Pike's Peak. The distance is about twelve miles. He had eaten a fair breakfast, but took no stimulants that day, either before or during the trip. He accomplished the ascent of the mountain in a few hours, in company with several others, and experienced no inconvenience. The party remained on the Peak about two hours before beginning the descent. Nothing peculiar was noticed in the young man until he had descended about 2000 feet, when some of the party observed his strange remarks and absent-minded condition. It was found on inquiry that he had forgotten nearly everything that had occurred during the day. When he reached Manitou, late in the afternoon, he did not remember at what hotel he had been stopping. He had paid for the hire of his horse, and his guide for his services, in the morning before starting, but on returning had forgotten all about it. When he reached his room in his hotel he had forgotten what he had done with his horse, and started to look for him. He remained in this confused and amnesic condition about thirty-six hours. I fortunately had an opportunity to interview him a few days after the strange occurrence. At the time of my conversation with him he said that he then remembered every incident of the day's journey, of which he was oblivious on the day of the ascent of the Peak. He told me he was not conscious at the time that anything was wrong with his memory, but was conscious of saying foolish things to which he could not help giving expres-

sion. He could afterward recall his dazed condition, loss of memory, and the laughter which he provoked among his party. He stated that he had on previous occasions ascended high mountains, some as high and some higher than Pike's Peak, but never before had had a similar experience from mountain climbing."

I have reported this case in full, as it illustrates a freak of memory found in a recent case of insanity which came under my experience. In July, 1887, a gentleman from Boston, member of a mountain climbing club, went to Estes Park, at an elevation of between 8000 and 9000 feet. At the end of a week or two he felt, as he expressed it, as though he were in a furnace, a sensation of intense heat, and began to lose flesh rapidly. In July of the present year (1890) I met an Englishman who had been in this country only a short time. He, in company with a number of gentlemen, was driving over some of the high ranges in the neighborhood of Leadville, at an altitude of 11,000 feet. He felt well and was quite hilarious, but suddenly became paretic in his legs and was unable to stand without assistance from a person on each side of him. He experienced no pain. The paresis disappeared as he reached a lower altitude, and he has had no difficulty in walking since. I have heard of one other who was mentally confused in making the ascent of high mountains in Colorado.

So far I have had nothing interesting to report from Professor Pickering, of the Astronomical Department of the Harvard University, owing to the fact that Pike's Peak was abandoned by him and his assistants after the first year (1887) as a point for observation.

Inflammatory Lesions of the Brain and Cord.—Under this division of my paper, read in 1887 before the Philadelphia Neurological Society, I gave the opinions of several physicians of Colorado in respect to the influence of the climate. Most of them thought inflammatory lesions of the brain and cord comparatively rare. Dr. Anderson, of Colorado Springs, stated: "The only lesion of the brain with which I have had any experience here has been softening, and I would say, from experience, that long residence in high altitudes is one of the most prolific sources of this affection. A number of cases in 'old timers' have come under my observation, and have

proved fatal." Dr. Jacob Reed, Jr., of the same place, thought that he had met with tubercular meningitis more frequently in Colorado Springs than he had in the same number of children either in Philadelphia or Michigan. So far as I know, only three cases of tubercular meningitis occurred in Colorado Springs from 1884 to 1887. The population during these years averaged about 6000. I do not know the percentage of deaths from tubercular meningitis that occur in the Eastern towns the size of Colorado Springs. One death annually in a population of 6000 seems to me comparatively small, and if we take into consideration the large proportion of the children of Colorado Springs born of consumptive parents, the death-rate is proportionately smaller to the consumptive population. It might be that the open-air life led by the children, and the bracing effects of the atmosphere, together with cool nights, even in midsummer, insuring refreshing sleep, enable the issue of consumptive parents to overcome the tendency to the development of the disease. Certainly this seems to be the case with reference to the development of tuberculosis of the lungs in children that are born and reside in Colorado. The dryness of the atmosphere favoring free perspiration is evidently a factor in the prevention of tuberculous and other inflammation of the central nervous system. My experience in Denver leads me to believe that tuberculous affections of the brain are proportionately larger here than in Colorado Springs. During my fourth year in Colorado Springs I saw two cases of infantile paralysis; none during the previous three years. I have observed only four such cases during two years in Denver. I did not hear of a single case of non-traumatic and non-tubercular meningitis during four years' residence in Colorado Springs, and have heard of only one during the past two years in Denver. I have studied six cases of acute myelitis—one of tumor of the cord, five of tumor of the brain, and eleven of chronic systemic degeneration of the cord—during the past two years in Denver, and have been unable to find any points of difference in the histories and progress between these troubles here and those of like nature observed at sea-level. Of their comparative frequency in this altitude I am unable to form an opinion, as most of the cases of gross lesions of the central nervous sys-

tem observed here have been seen in hospitals in patients from various portions of the State. It is probable that persons suffering from chronic degenerative conditions of the cord experience an apparent improvement in their nervous conditions on coming to Colorado, not, I believe, from the direct influence of the climate on their nervous affections, but, indirectly, on account of improved condition resulting from the stimulating and bracing effects of the atmosphere. Dr. Solly thinks he has seen temporary good effects produced by a residence in Colorado on chronic inflammatory lesions of the cord.

Chronic Degeneration of the Brain.—That mental failure begins earlier in life in persons who have lived and struggled for many years in Colorado, and is in many cases attended by symptoms of chronic degeneration of the brain more frequently than is the case in similar individuals East, is recognized by the profession and laity generally. That this belief is correct, after six years' observation, I have no doubt. The practical question is, Is it due to long residence in high altitudes, as many maintain, or has it been caused by something peculiar, or at least prominent, in the lives and business habits of Colorado's pioneers? To answer this inquiry intelligently, we must consider several factors in the lives of these men. These persons lived in Colorado many years, surrounded by treacherous Indians and still more treacherous desperadoes. The mining interests of the State from 1859 to 1870 were her main and almost her sole resource for those seeking wealth. The uncertainty of fortune and the feverish excitement in the speculative miner's life—prospective millions to-day, realized poverty to-morrow—kept them under great mental strain. For some, to the prolonged mental excitement and worry we may add irregular hours for eating, often insufficient food and sleep for days, and no relaxation for years; and for others we may still add indulgences in alcoholic and venereal excesses; and still for a third class, gambling. Are not these causes sufficient to wear a man out at any altitude and in any climate? What is the cause of the early mental and physical wreck seen in so many of the Wall Street brokers and railroad magnates? Is it altitude? Certainly not. Then why attribute so much to high altitude as the factor determining the early break-down of persons who have crowded so much worry and

mental excitement into so short a space of time? Again, some of the pioneers brought their wives to Colorado with them, and if altitude was the great cause of mental failure, these too should suffer in a similar manner. Practically this is not the case. The female often becomes nervous and sleepless, but she does not suffer in Colorado from chronic brain degeneration in the same proportion as the male sex. I fortunately have had opportunities to examine the brains and blood-vessels of some who have suffered and died in Colorado, comparatively early in life, from chronic brain degeneration. The blood-vessels have been found diseased in every case, and in some slight chronic meningitis has co-existed. I believe arteritis is the primary lesion in the majority of cases of early mental break-down in Colorado. The climate may, and doubtless does, play a small part in the matter, but not nearly so great as has been popularly attributed to it.

Apoplexy.—Three years ago Dr. Strickler, of Colorado Springs, with an experience of seventeen years there, and Dr. B. P. Anderson, with ten or twelve years' experience in the same place, stated that they had not seen a case of cerebral haemorrhagic apoplexy in Colorado. This struck me as being very strange, and after referring to three cases of apoplexy that I had seen, or of which I had personal knowledge, occurring in Colorado Springs in 1887, I added: "I see no reason why haemorrhagic apoplexy should not be as frequent in Colorado as we find it at sea-level." During the last eighteen months I have either had under my own care, or seen in consultation with other physicians, seventeen cases of apoplexy. I doubt if the climate has much to do *per se* in the production of apoplexy, but I do believe that violent exercise in high altitudes in persons with weak cerebral arteries is more dangerous than in such persons at low altitudes.

Sunstroke or heat stroke is almost unknown in Colorado. A few years ago it was said never to have been known to occur here. Its absence is accounted for by the active capillary circulation of the skin, by the free evaporation of moisture from the surface of the body, and by the increased amount of watery vapor given off from the pulmonary mucous membrane into the rarefied and dry air. During the summer of 1889 I saw a man who had been overcome and who died from the

effects of the heat while working in the Grant Smelter of this city. The day was warm and sultry for Colorado. The man was working near one of the large furnaces in the smelter, and his death was due to artificial heat.

Paræsthesia.—Two cases of paræsthesia, one of which was seemingly due to high altitude, have recently come under my observation. After studying them more fully, if they should prove to be as interesting as they now seem, I intend to publish a detailed account of them.

EDITOR'S TABLE.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

THE FILTH-FEVER IN ALBANY.—It would be difficult to find a better illustration of the fatal results of the teaching of the late Dr. Lethaby, Medical Officer of Health to the Corporation of London, twenty years ago, and his following in this country, than that which now obtains at Albany, N. Y.

The people of London were taught by Dr. Lethaby that there was no danger from discharging sewage into the Thames, or any other running stream, after a flow of ten or twelve miles from the place of its introduction, provided the amount poured in did not exceed one twentieth part of the volume of water with which it was mixed ; or, in other words, that sewage mixed with twenty times its volume of running water, after a flow of ten or twelve miles, is absolutely destroyed. This he considered proven, regardless of the results on the health of people by the use of such water, because he was not able to detect any impurities by analysis !

Unfortunately, the people of Albany were induced to accept the views of Dr. Lethaby, notwithstanding the sewage of Troy and West Troy, at that time comprising a population of 70,000, was flowing into the Hudson, only six miles above.

The volume of water was so great as compared with the

amount of sewage poured into it, the proponents of the river water-supply urged that the sewage would be wholly destroyed and returned to its original elements before reaching Albany. The proposition was accepted.

Since that time the population of Troy and West Troy has increased to about 100,000, and that of the towns on the upper Hudson and its tributaries within a short distance above, to as many more—all pouring their sewage into the river above Albany's water intake. Meanwhile, typhoid-fever and allied diseases have prevailed in that city, *pari passu*, with the constantly increasing pollution of the water-supply.

At the time of this writing we have before us the following report :

ALBANY, N. Y., Feb. 3, 1891.

Ever since the first week in January doctors have been reporting from six to fourteen cases of typhoid-fever daily to the city Board of Health. With but few exceptions all these are in a section of the city that is supplied with water from the Hudson River. As the fever has been prevalent in the cities up the river, which drain into it, the general belief is that the water has caused the disease here.

Dr. Balch, the city Health Officer, who is also the executive officer of the State Board of Health, however, persists in denying the existence of typhoid-fever in Albany, and has also denied that the existing sickness was due to the water, but claimed it was caused by sewer-gas poisoning. As the typhoid cases were reported chiefly by the leading physicians here the denial of the correctness of their diagnosis has caused no little comment.

Dr. Balch reported that during January 203 cases of typhoid-fever had been reported to him, and that 18 deaths had been caused by it. He, however, insisted that there was very little true typhoid-fever among all the reported cases. Although admitting that it was more prevalent in this city than usual, he said he did not know what to call the prevailing disease, but still inclined to the belief that defective drainage caused it.

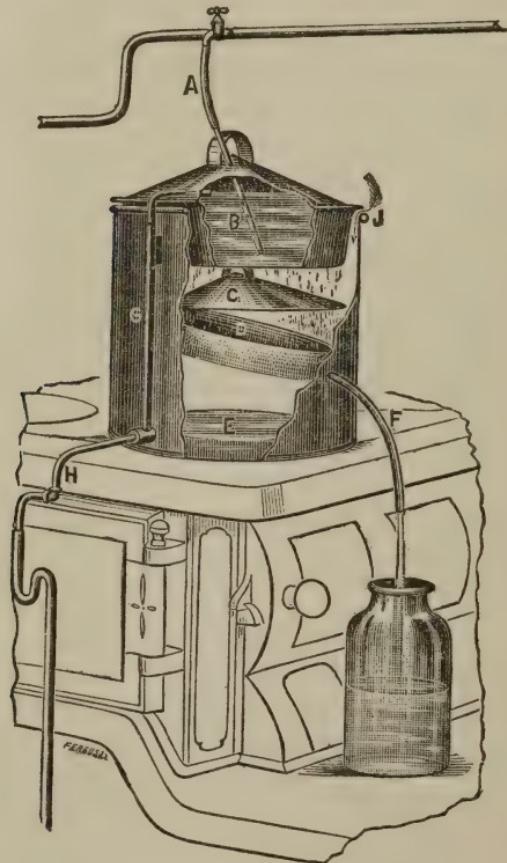
Commissioner Kurth challenged this statement, saying that he, in common with many others, firmly believed the fever was due to the water-supply being poisoned by sewage.

Dr. Balch said that a biological analysis of the suspected water was now being made.

Availing ourselves of the occasion attending the State Medical Society, at Albany, at the time the above report was made, we conversed with several of the physicians with regard to the

prevalence of the disease, its nature and cause. Some think the disease, generally, is not typical typhoid-fever. Hence, taking advantage of the health officer's opinion, they do not report all their cases, but only those which are well-marked typhoid ; but all agree as to the source of the disease.

The old water board also takes advantage of the health officer's equivocal opinion, and is assiduously urging an additional pumping station, at public expense, to increase the supply, and boldly asserts that the mass of 8,000,000 gallons of sewage which Troy and West Troy empty into the river daily, only six miles above, and as much more by the other cities, only a little farther up, is eliminated by natural purification before Albany is reached !



In the course of our inquiries we were gratified in not finding any physician ready to sustain the effort of the death-dealing water board, and, moreover, in finding one physician

in the diligent use of protective measures, by boiling and distilling all the water used in his household for drinking and culinary purposes.

The *still* we found him using is of his own invention, and is so simple and yet so efficacious and easy of adaptation, that we take pleasure in appending the following description of it, and commanding it to the people of Albany not only, but to all who may be in like danger of being poisoned by the use of polluted drinking-water, or who are in need of distilled water for other purposes :

It consists of a tin-lined copper vessel having a water-tight chamber *B* connected by a rubber tube with faucet *A* to the water-supply pipe, or water tank, as the case may be. A small stream is admitted through the tube *A*, which keeps the chamber *B* cool. The overflow passes through pipe *G* into the lower part *E*. The water is here kept at the desired level by means of an overflow pipe *H*, properly trapped, connected with the waste water pipe.

The still is used by placing it upon the cooking stove or range. Steam is quickly generated in chamber *E*, and rises through opening *D*, which is surrounded by a gutter fastened to the inside of the vessel. The steam then passes upward around the shield *C* and, coming in contact with the renovated air admitted at *I*, the cool surface of chamber *B* there condenses it, and the condensed water drops on and is shedded off of shield *C* into the gutter. It then runs through the gutter and pipe *F* to a receptacle for use.

The still is made in different sizes of capacity to condense a gallon or more hourly, according to the amount of heat used.

The water differs from the ordinary distilled water for the reason that air is freely admitted during the process.

For further particulars the reader is referred to Dr. Nelson Hunting, Hamilton Street, Albany, N. Y.

FOOD AND HEALTH EXPOSITION.—The Food and Health Exposition to be held at Lenox Lyceum, Madison Avenue and Fifty-ninth Street, New York, in March, 1891, under the auspices of the New York Retail Grocers' Union, promises to be of great public interest. It is expected to assist the building fund of the New York Retail Grocers' Union, which is ambi-

tious to give unto itself a local habitation worthy of its name. While the past eight years have shown that it was devoted to an idea that could not be defeated, yet an idea with a glorious pile of brick and mortar around it has a much better chance of immortality.

The formation of a food, health, and home movement may be expected to be one of the results of the coming exposition, as well as a handsome financial balance to the credit of the building fund.

INSTRUCTION IN HYGIENE.—A course of instruction in practical hygiene, under the charge of Dr. John S. Billings, Surgeon U. S. Army and Lecturer on Hygiene, and Dr. A. C. Abbott, Assistant in Bacteriology and Hygiene, in the JOHNS HOPKINS HOSPITAL, will be given in this institution during the months of March, April, and May, 1891.

The course will begin Monday, March 2d, and will continue for four days in each week (Monday, Tuesday, Thursday, and Friday) from 9 until 12 o'clock A.M., until Friday, May 29th. One hour each day will be given to demonstrating the methods to be employed in the day's work, the remaining two hours will be for the practice of the methods by the students. The instruction will comprise lectures and practical work in the laboratory.

The fee for the course will be \$50.

Only those students who give evidence of fitness to profit by the course will be received. The right is reserved to ask the withdrawal of any student who, for any reason, is not making a success of the work.

Applications for admission to the course should be addressed to the Superintendent of the Johns Hopkins Hospital, North Broadway, Baltimore, Md.

THE ORTON PRIZE.—In reply to inquiry for particulars, the author deems the proposition and conditions sufficiently explicit.

THE PROGRESS OF INFECTIOUS DISEASES AND MORTALITY RATES AT THE MOST RECENT DATES, BASED UPON OFFICIAL AND OTHER AUTHENTIC REPORTS.

COMPILED BY HARRY KENT BELL, M.D.

ALABAMA.—*Mobile*, 40,000 : Reports 81 deaths during December, of which 17 were under five years of age. Annual death-rate, 24.3 per 1000. From zymotic diseases, 6, and from consumption, 19.

CONNECTICUT.—For the month of December the Secretary of the State Board of Health reports 999 deaths in 168 cities and towns aggregating 744,278 inhabitants, showing the temporary annual death-rate for the State to be 16.1 per 1000. The mortality from zymotic diseases was 122, being 12.2 per cent of the total. From consumption there were 111 deaths.

New Haven, 85,830 : Total deaths, 148—32 under five years of age. Annual death-rate, 18.1 per 1000.

Hartford, 53,000 : Total deaths, 85—17 under five years of age. Annual death-rate, 14.5 per 1000.

Bridgeport, 48,740 : Total deaths, 57—18 under five years of age. Annual death-rate, 12.5 per 1000.

Waterbury, 33,180 : Total deaths, 40—8 under five years of age. Annual death-rate, 14.4 per 1000.

DISTRICT OF COLUMBIA, 250,000 : Total deaths in four weeks ending December 27th, 385—115 under five years of age, and 173 in the colored population. Annual death-rate, 20.0 per 1000. From zymotic diseases there were 60 deaths, and from consumption, 54.

FLORIDA.—*Pensacola*, 15,000 : Month of December, 1890. Total deaths, 14, including consumption, 7, and enteric-fever, 2.

ILLINOIS.—*Chicago*, 1,100,000 : During the month of December there were 1700 deaths—760 under five years of age, representing an annual death-rate of 18.91 per 1000. From zymotic diseases there were 302 deaths, and from consumption, 150.

INDIANA.—*Evansville*, 50,600 : Month of November, 1890. Total deaths, 61, including phthisis pulmonalis, 9 ; diphtheria, 5 ; enteric-fever, 4 ; and croup, 1.

IOWA.—*Keokuk*, 18,589 : Month of December, 1890. Total deaths, 18, including phthisis pulmonalis, 1 ; diphtheria, 3 ; and enteric-fever, 1.

LOUISIANA.—*New Orleans*, 254,000 : During the four weeks ending December 27th there were 813 deaths—164 under five years of age, and 272 in the colored population. Annual death-rate, 41.75 per 1000. From zymotic diseases there were 77 deaths, and from consumption, 106.

MARYLAND.—*Baltimore*, 455,427 : Reports for four weeks ending December 27th, 627 deaths—211 under five years of age. From zymotic diseases there were 71 deaths, and from consumption, 88. Annual death-rate, 22.39 per 1000.

MASSACHUSETTS.—*Worcester*, 85,000 : Month of December, 1890. Total deaths, 124, including consumption, 23 ; scarlet-fever, 1 ; diphtheria, 3 ; and croup, 1.

Boston, 448,477 : Reports for December 850 deaths—225 under five years of age. Annual death-rate, 22.74 per 1000. From zymotic diseases there were 100 deaths, and from consumption, 125.

MICHIGAN.—For the month of December, 1890, compared with the preceding month, the reports indicate that puerperal-fever, cholera infantum, pleuritis, membranous croup, pneumonia, inflammation of bowels, inflammation of brain, measles, and whooping-cough increased, and that typhoid-fever and scarlet-fever decreased, in prevalence.

Compared with the average for the month of December in the four years 1886-89, pleuritis, membranous croup, influenza, puerperal-fever, cholera infantum, bronchitis, and cholera morbus were more prevalent, and measles, typho-malarial-fever, whooping-cough and typhoid-fever were less prevalent in December, 1890.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of December, 1890, at seventy places, scarlet-fever at one hundred places,

typhoid-fever at forty-one places, and measles at thirty-three places.

Reports from all sources show diphtheria reported at five places more, scarlet-fever at thirty-two places more, typhoid-fever at nine places less, and measles at ten places more in the month of December, 1890, than in the preceding month.

Detroit, 220,000 : Reports for December 285 deaths—60 under five years of age. Annual death-rate, 15.25 per 1000. From zymotic diseases there were 80 deaths, and from consumption, 25.

MINNESOTA.—St. Paul, 150,000 : Reports for December 123 deaths, of which 48 were under five years of age. There were 21 deaths from zymotic diseases, and 6 from consumption. Annual death-rate, 9.84 per 1000.

MISSOURI.—St. Louis, 460,000 : Reports during December 679 deaths, of which 209 were under five years of age. Annual death-rate, 17.71 per 1000. From zymotic diseases there were 96 deaths, and from consumption, 67.

NEW JERSEY.—Paterson, 78,350 : Reports for the month of December 145 deaths, of which 57 were under five years of age. Annual death-rate, 21.1 per 1000. From zymotic diseases there were 28 deaths, and from consumption, 20.

Hudson County, 292,734 : Reports for December, 1890, 599 deaths, of which 234 were under five years of age. Annual death-rate, 21.5 per 1000. From zymotic diseases there were 111 deaths, and from consumption, 61.

NEW YORK.—The Secretary of the State Board of Health reports that the total mortality for December is about 1000 more than in November, which is always the healthiest month in the year. The number of deaths from zymotic diseases is but little greater, however, the increase being chiefly in diseases of the respiratory, nervous, and circulatory organs. There were 500 more deaths from acute respiratory diseases, and the number is greater than in December, 1889. The zymotic mortality is also a little higher than in either of these two months. Typhoid-fever shows a falling off. Scarlet-fever is increasing and has been since August, but has caused less than 150 deaths. Measles has also increased, but has a lower

death-rate than in the summer. Diphtheria has caused about 50 more deaths than in November and 50 less than in December, 1889. The death-rate of 135 cities and villages is 21.60 per 1000 population annually.

New York, 1,631,305 : Total deaths, 3184—1113 under five years of age. Annual death-rate, 22.98 per 1000. From zymotic diseases, 475 deaths, and from consumption, 440.

Brooklyn, 852,467 : Total deaths, 1684—630 under five years of age. Annual death-rate, 23.25 per 1000. From zymotic diseases, 258 deaths, and from consumption, 178.

Buffalo, 255,000 : Four weeks ending December 27th, total deaths, 343—148 under five years of age. Annual death-rate, 18.9 per 1000. From zymotic diseases, 73 deaths, and from consumption, 35.

Rochester, 128,327 : Total deaths, 179—47 under five years of age. Annual death-rate, 15.50 per 1000. From zymotic diseases, 56 deaths, and from consumption, 22.

Albany, 103,000 : Total deaths, 178—47 under five years of age. Annual death-rate, 20.73 per 1000. From zymotic diseases, 21 deaths, and from consumption, 30.

Syracuse, 87,000 : Total deaths, 100—23 under five years of age. Annual death-rate, 13.80 per 1000. From zymotic diseases, 4, and from consumption, 14.

NORTH CAROLINA.—The State Board *Bulletin* summarizes the mortuary statistics of eleven towns for the month of December, as follows : Population, 50,700 white and 42,200 colored. Total deaths, 122—80 colored, and 40 under five years of age. From zymotic diseases there were 8 deaths, and from consumption, 16.

Wilmington, 21,000 : Total deaths, 45—22 under five years of age. Annual death-rate, 25.7 per 1000.

Raleigh, 15,000 : Total deaths, 20—2 under five years of age. Annual death-rate, 16.0 per 1000.

Asheville, 10,000. Total deaths, 11—5 under five years of age. Annual death-rate, 13.2 per 1000.

OHIO.—From the *Monthly Sanitary Record* of the State Board we take the following report for the month of November : The total number of deaths in sixty-three cities and towns,

with an aggregate population of 1,271,139, was 1509, of which 406 were under five years of age. From zymotic diseases, 375, and from consumption, 193. Annual death-rate, 15.35 per 1000.

Cincinnati, 296,951 : Total deaths, 451—157 under five years of age. Annual death-rate, 18.23 per 1000.

Cleveland, 261,546 : Total deaths, 263—54 under five years of age. Annual death-rate, 12.10 per 1000.

Columbus, 90,398 : Total deaths, 95—22 under five years of age. Annual death-rate, 12.61 per 1000.

PENNSYLVANIA.—*Philadelphia*, 1,064,277 : Reports that during the four weeks ending December 27th there were 1520 deaths, of which 467 were under five years of age. Annual death-rate, 18.6 per 1000. From zymotic diseases there were 208 deaths, and from consumption, 195.

Pittsburg, 240,000 : Reports 347 deaths during the four weeks ending December 27th, of which 125 were under five years of age. Annual death-rate, 18.7 per 1000. There were 73 deaths from zymotic diseases, and 24 from consumption.

RHODE ISLAND.—The number of deaths reported during December was 447, in a population aggregating 314,810. Annual death-rate 16.9 per 1000. There were 33 deaths from zymotic diseases, and 45 from consumption.

TENNESSEE.—*Chattanooga*, 40,000 : Total deaths, 56—23 under five years of age. Annual death-rate, 16.8 per 1000.

Knoxville, 43,706 : Total deaths, 56—8 under five years of age. Annual death-rate, 15.37 per 1000.

Memphis, 64,586 : Total deaths, 104—12 under five years of age. Annual death-rate, 19.32 per 1000.

Nashville, 76,309 : Total deaths, 114—29 under five years of age. Annual death-rate, 17.91 per 1000.

TEXAS.—*San Antonio*, 50,000 : Month of November, 1890. Total deaths, 117, including phthisis pulmonalis, 16; enteric-fever, 1, and croup, 3.

WISCONSIN.—*Milwaukee*, 220,000 : Reports for December 293 deaths, of which 65 were under five years of age. Annual death-rate, 15.98 per 1000. There were 67 deaths from zymotic diseases, and 24 from consumption.

LITERARY NOTICES AND NOTES.

TEXT-BOOK OF HYGIENE: A COMPREHENSIVE TREATISE ON THE PRINCIPLES AND PRACTICE OF PREVENTIVE MEDICINE FROM AN AMERICAN STANDPOINT. By GEORGE H. ROHÉ, M.D., Professor of Obstetrics and Hygiene in the College of Physicians and Surgeons, Baltimore; Director of the Maryland Maternité; Member of the American Public Health Association; Foreign Associate of the Société Français d'Hygiène, of the Société des Chevaliers-Sauveteurs des Alpes Maritimes, etc. Second edition. Thoroughly revised and largely rewritten, with many illustrations and valuable tables. 8vo, pp. 430, price \$2.50. Philadelphia and London: F. A. Davis.

Virtually a new book, rendered the more necessary by the advance of practical sanitation in the United States, even during the short period of five years since Dr. Rohé's first book was published, under the same title.

The progress made in the discovery and application of disinfectants alone during the last five years, in which the author, as member of the Committee on Disinfectants of the American Public Health Association, is well known to have been an active participant, is amply sufficient, to say nothing about other important subjects, to justify the revision.

The work is admirably arranged for a student's text-book. It begins with the first necessities—air, water, food, and domestic hygiene—and then proceeds to the consideration of things and conditions pertaining to communities, special and general, building sites, habitations, schoolhouses, hospitals; industrial, military, and naval hygiene; prisons; exercise and training; baths and bathing and clothing; disposal of the dead; the germ theory of disease; contagion and infection; epidemic diseases; antiseptics, disinfectants, and deodorants; vital statistics and quarantine. The chapters on naval hygiene and quarantine are respectively by Medical Director A. L. Gihon, U. S. Navy, and Surgeon Walter Wyman, U. S. Marine Hospital Service.

Excepting the chapter on the disposal of the dead, all the

subjects treated of show a comprehensive and, for the most part, sufficient appreciation of the conditions involved. But in this chapter, while the author urges the importance of the speedy removal of the bodies of the dead from the immediate vicinity of the living, particularly the dead of infectious diseases, and gives good reason for it, he recognizes no danger from the inhumation of such bodies, provided the soil of the burial ground is dry and porous, so as to be easily permeated by the air; and, to this end, the graves need not be deeper than one and a half metres to the top of the coffin. How far distant from wells and other sources of water supply the graves should be is not suggested. Surely, among other conditions scarcely less beyond the control of the sanitary authorities in many places, the author should have added: And further provided, that the graves in dry and porous soil which freely admit the access of air shall not permit the escape of the gases of decomposition and the disease germs which such gases are likely to bear; and, moreover, such graves shall not be exposed to rain during the uncertain period of the process of putrefaction of the bodies which they contain, because they are thereby liable to have all the liquid and soluble results drained into neighboring wells and other sources of water supply.

Notwithstanding, the author observes: "An unprejudiced consideration of the subject shows that there is no trustworthy evidence that any of the gases exhaled by decaying or putrefying bodies are injurious to health. . . . Where bodies are properly buried, and the ground is not overcharged with corpses, it is not probable that infectious diseases are propagated from interred bodies. There are no facts on record which show such an event has occurred." Probably because the author does not accept as facts the account in detail by Johnson (on Tropical Climates, pp. 83-85), of the fatal effects of the gases inhaled, consequent upon the accidental breaking in of a coffin lid, by two American sailors who were digging a grave for the burial of a comrade near Canton some years ago, and other cases cited by the same author; nor the statements of Sir Spencer Wells, Dr. Alfred Carpenter, Ernest Hart, and others, at the meeting of the Scottish Burial Reform Association, in 1888 (the *Sanitary Journal*, December, 1888, and January, 1889),

giving names of places and dates of epidemics of scarlatina and other epidemic diseases consequent upon the digging up of old cemeteries or opening graves, in England, Scotland, and elsewhere ; nor the common prevalence of typhoid-fever among communities whose water supply is exposed to cemetery seepage, exclusive of all other recognizable sources of pollution, as, for example, that of Brooklyn, where there were 182 deaths from typhoid-fever last year ; and of New York, where the water supply is almost equally well protected from all other sources of pollution, and where there were more than twice as many more deaths from the same cause. It would be easy to cite many other examples of the same kind, difficult to account for in any other way than by cemetery emanations and seepage. And ere another edition of this otherwise excellent book is called for—and we sincerely wish it may be soon—there is good ground for the hope that, in the multiplication of facts which are constantly accumulating on the danger of inhumation, particularly of the dead from infectious diseases, the author may be able either to controvert such facts as those here alluded to, or accept them and qualify his teaching accordingly.

ANNOUNCEMENT : E. B. Treat, Publisher, New York, has in press for early publication the ninth yearly issue of the " International Medical Annual."

Its corps of thirty-seven editors—specialists in their respective departments, comprising the brightest and best American, English, and French authors—will vie with previous issues in making it even more popular and of more practical value to the medical profession.

We have the assurance of some of the best medical practitioners that the service rendered their profession by this Annual cannot be duplicated by any current annual or magazine, and that it is an absolute necessity to every physician who would keep abreast with the continuous progress of practical medical knowledge.

Its Index of New Remedies and Dictionary of New Treatment, epitomized in one ready reference volume at the low price of \$2.75, make it a desirable investment for the busy practitioner, student and chemist.

Also in press : " Lectures on Diabetes," by Robert Saundby, M.D., Edinburgh, 300 8vo pages, \$2.75, and " Sexual Neurasthenia," by G. M. Beard, M.D., and A. D. Rockwell, M.D., third edition, enlarged, \$2.75.

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WHAT CONSTITUTES A FILTH DISEASE?

READ AT THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION, CHARLESTON, S. C., DECEMBER 18TH, 1890.

By S. W. ABBOTT, M.D., Secretary of the State Board of Health of Massachusetts.

THE doctrine that filth plays an important part in the causation of disease lies at the foundation of very much of the sanitary administration of cities and towns throughout all civilized countries. The popular impression, however—and undoubtedly the belief among a very large part of the medical profession, as well as among many of the officials who have the charge of sanitary administration—is that filth in the ordinary sense of the word is itself the active cause of disease, and that little else is essential to the production of certain infectious diseases than to deposit a certain amount of filth, or to allow such filth to accumulate within the premises occupied by a given population, in order to generate a pestilence. Hence the activity of sanitary bureaus in sweeping out filth, in cleansing foul spots, in removing garbage, in depositing tons of disinfectants in cesspools, catch-basins, and sewers. This activity in the cleansing of towns, the removal of filth, the sanitation of houses, cellars and yards is commendable so long as the true *rôle* of filth in the causation of disease is not lost sight of, and the entire energy of sanitary organizations is not expended in this one direction.

The statements which I have to offer in this paper are partly the result of observation in twenty years of a busy country practice, followed by several years of official sanitary work.

One of the striking peculiarities of medical science, sanitary as well as otherwise, is its freedom from the trammels of mathematical laws. The human body is not a machine, but a complex and highly organized structure, and each individual of the species differs in many points from other individuals. One cannot expose a score of human beings to the contagion of small-pox or that of scarlet-fever and predict with certainty just how many out of the number will take the disease ; and if a certain number become infected, no one can say how many will die ; and of those who survive no one can foretell how many will suffer for years with the serious results of the sequelæ of disease. No ; the human body cannot be put into a mathematical machine with the certainty of securing certain definite results by simply turning a crank.

What is the usual course of action in investigating the causes of an outbreak of any one of the diseases which are commonly termed filth diseases ? Let us suppose that a case of diphtheria has occurred in the family of John Smith, and this case has been followed within forty-eight hours or more by another. A physician is called in by Mr. Smith. Usually, after the first or second visit, the physician determines the case to be one of diphtheria ; and if the local statutes require it, and he is cognizant of the welfare of the community, he notifies the sanitary authority of the district or city, and the sanitary authority in the majority of instances contents himself with lying on his oars until the patient has either died or recovered, and then sets his agents at work to disinfect the apartment which the patient occupied, possibly one or more rooms, and possibly the whole house. If the case has been a serious one, or if several persons have been attacked, the inquiry usually arises : What can be the matter with that house, and what is the condition of its drainage and plumbing ? The sanitary authority sets his agent at work again to examine the plumbing, and he invariably finds a defect, since the majority of houses have some such defect. A leak is found in the soil-pipe, an over-

flowing privy-vault, a foul cesspool, an untrapped sink-drain, or a filthy cellar. The defects are soon remedied, and the agent reports everything in a satisfactory condition. Does it occur to him to make further inquiry as to the cause? In therapeutic medicine he who expects success in the treatment of disease must be a close observer of his patients, must study, not only the present condition of his patient, as the temporary, objective and subjective symptoms may present themselves upon a single visit, but must learn, if possible, his entire physical history, his heredity, and the effect which race, condition in life, occupation, age, and climate may have had upon him; so in the broader field of preventive medicine, the successful sanitarian will not content himself with merely spying out and removing filth, but will leave no stone unturned until he has ascertained all the conditions which have contributed to the production of a case of infectious disease or to the spread of an epidemic.

The opinion that filth is not a direct cause of disease, but is merely one of the conditions essential to the propagation of certain diseases of the infectious class, is by no means a new one. In his introductory to the report to the Privy Council, published in 1873, Mr. John Simon used the following language, in which the notions of the present day relative to the part which filth plays in the production of certain diseases appear to have been foreshadowed :

"The exacter studies of modern times have further shown that by various channels of indirect and clandestine influence, filth can operate more subtly and also far more widely and more destructively than our forefathers conjectured. The later almost equally with the former knowledge, the finer almost equally with the general, is indispensable for sanitary administration in modern times; and filth is little likely to be guarded against with that thoroughness of detail which present science shows to be necessary, unless the detail follow some intelligent appreciation of the ways in which filth becomes destructive."

And still further, in the same report, he says :

"While the excessive production of fatal disease in filthy neighborhoods is a fact as to which there can be no doubt, and of which the immediate significance is deplorable, the

ulterior suggestion is this : that so far as filth in any instance produces anew such a disease as erysipelas or puerperal-fever, on the one hand, or phthisis or other tubercular disease on the other, the mischief first done is of a sort which entails certain possibilities of extension ; such, namely, that in the one instance by accidental contagion, as in the other instance by hereditary transmission, it may, for aught we know, indefinitely extend beyond the sphere in which filth first produced it."

As a comment upon the foregoing paragraph, there can be but little doubt that puerperal-fever is a true filth disease, transmitted from the sick to the well, in many instances in consequence of neglect of such antiseptic precautions as are now known to be absolutely essential to the safety of the lying-in mother. It is for this reason that the suggestive term "Finger-nail Fever" has very properly been given to it in some parts of England. It is an essentially preventable disease, and as such is as amenable to sanitary rules and regulations as any other infectious disease.

With reference to the prevention of filth diseases, Mr. Simon makes the following statement :

" In order to the prevention of filth diseases, the prevention of filth is indispensable. Truism though this may seem, I think it needs to be expressly insisted on, as against any belief that districts allowed to become filthy can off-hand be made wholesome by disinfectants. To chemically disinfect (in the true sense of that word) the filth of any neglected district, to follow the body and branchings of the filth with really effective treatment, to thoroughly destroy or counteract it in muck-heaps, and cesspools, and ash-pits, and sewers and drains, and where soaking into wells and where exhaling into houses, cannot, I apprehend, be proposed as physically possible. . . . This opinion as to the very limited degree in which chemistry can prevail against arrears of uncleanliness does not at all discredit the appeals which are constantly and very properly made to chemistry for help in a quite different sphere of operation ; with regard, namely, to the management of individual cases of infectious disease, and to the immediate disinfection of everything which comes from them. In this latter use of disinfectants everything turns on the accuracy and completeness

with which each prescribed performance is done ; but such accuracy and completeness are of course only to be insured where operations are within well-defined and narrow limits ; and in proportion as disinfection pretends to work on indefinite quantities or in indefinite spaces, it ceases to have that practical meaning."

A due regard to the principles laid down by Mr. Simon in this paragraph would undoubtedly have saved the cost of an experiment once performed in one of our large cities—namely, the disinfection, or the attempt at disinfection, of some 200 miles of a public system of sewerage. Surely, if there is any place where disinfection may be said to have been applied to indefinite quantities and to indefinite spaces, such quantity and such space existed in the constantly running stream of liquid filth coursing through the cavity of a public sewerage system. No matter how large the dose of disinfectant deposited in such a stream, it was sure to be immediately washed away, with the added possibility of reinfection from one or more of its 10,000 connections at the very next moment. The only possible mode of disinfecting such a stream is to prevent its infection by preventing the introduction of infectious material into it.

Undoubtedly each and all of the so-called filth diseases may find their victims in houses that are absolutely faultless, provided that conditions otherwise favorable exist in such houses, the prime condition being the presence of human beings. A child sick with diphtheria, in any house whatever, constitutes a menace to the health of every one who lives in the house, and especially to the younger portion of the household. This again is but one of the essential conditions to the propagation of infectious disease.

The science of horticulture and the study of infectious diseases have certain points in common. The fruit culturist well knows that his trees need many conditions as essential to success. The fruit-tree, be it apple, pear, cherry, or peach, needs a good soil, sunlight, moisture or rain, and a temperature neither too hot nor too cold, in order to secure a good crop. Substitute in place of either of these conditions some opposite condition, and the crop will be sure to fail. In place of sunlight substitute darkness, in place of a good soil substi-

tute sand, in place of moisture substitute dryness, or salt water in place of fresh, and the result will be the same. Now, in the study of the causes of disease, if there is anything clearly taught us by the wonderful discoveries of the present day it is that infectious diseases find their parallel in the field of animate and inanimate nature.

In the case of many of the infectious diseases we find that, while human beings constitute the proper soil for the propagation and cultivation, some of them are susceptible of cultivation in other animals, and some may be cultivated upon favorable soil outside the bodies of living animals. The results of the experimental researches of recent years in regard to the natural history of infectious diseases appear to show that what the older observers were wont to call causes were conditions only, and that dryness or moisture of the air or of the soil, high or low water in wells, high temperature and low temperature, over-crowding or density of population, faulty ventilation and the presence of filth, are simply the favorable or unfavorable conditions in the propagation of disease, and not in any sense its causes.

Analogy would also teach us that the actual cause of an infectious disease is the disease itself—that is to say, a previous case—and the more we learn of the origin of epidemics, as well as of so-called sporadic cases, or, to use a term more applicable to the meaning which was originally applied to them, “autochthonous” cases, the more are we inclined to look for previous cases as the true cause or origin. Nor does the fact that we do not find the previous case prove its non-existence.

How often is the theory of spontaneous development brought forward not only by the householder, but also by the practising physician, and by the term “practising physician” I do not mean the bright, wide-awake, well-rounded practitioner, who combines with the best knowledge of therapeutic measures, freed from all dogmatic trammels, a careful application of the principles of preventive medicine, but the old-time practitioner, the easy-going family doctor, whose entire stock in trade, like that of Dr. Holmes's Rip Van Winkle, lay in the contents of his ponderous saddle-bags!

The latter is called to a case of scarlet-fever which has

occurred in the person of a young girl of seven years who lives in a secluded house with her family in the forest or upon the prairie, a mile from any other habitation. Hence the old-time practitioner infers, "Here is a sporadic case; it must have originated *sua sponte*; it is surely autochthonous." Such an argument is not only fallacious, but lamentably defective. As well might the farmer say the potato which springs up in a neglected corner of his field originated *sua sponte* because he did not himself happen to see or to plant the seed or tuber which produced it; or to go a step further into the region of vegetable life and question those forms whose seeds or spores are less tangible, a crop of mushrooms comes up upon my lawn. Regardless of the application of fertilizers which have been applied from my neighbor's stable, I might say these mushrooms have appeared *sua sponte*; but the keen observer of the habits of the mushroom knows very well that such a theory has no foundation; each variety reproduces itself; and I find that a patch of these mushrooms transferred to another part of my garden will continue to appear there year after year, so long as favorable conditions promote their growth and reproduction. Now let us apply this reasoning to the case of scarlet-fever in the forest. The theory of spontaneous origin is simply a confession of ignorance; and the keen observer cannot admit it until such questions as the following have been satisfactorily answered:

Has this girl had any communication with other human beings outside of the family within the ordinary and acknowledged period of incubation, and especially with persons living in infected houses, or have any other inmates of the house had such communication?

Have any human beings, either relatives or others, visited the house (the grocer, the butcher, the milkman, the postman) within such period? Each of these sources opens up further avenues of infection.

Have letters or other mail matter, or currency of any sort, especially from infected districts, been received at this house?

Have the domestic animals been interrogated? The transmission of infectious diseases from the domestic animals to man has become too well established to admit of doubt. (See British Local Government Board Reports, Supplements for 1886 and 1888.)

I have indicated only a few of the possible avenues of infection. Undoubtedly there are many others; and not until every avenue has been searched and found to be closed can the theory of spontaneous origin be entitled to any credence, and even then it cannot be regarded as established, since the absence of a cause to the discernment of the ordinary senses of sight, taste, and smell and touch does not prove its non-existence.

Let us now pass from the general subject, and consider briefly some of the so-called filth diseases separately.

By some authorities *small-pox* is called a filth disease. In several instances I have been called upon to appear before legislative committees to testify upon the subject of vaccination; the opponents of this practice almost uniformly state their belief in the theory that small-pox is a filth disease, that it originates in filth, and that all that is essential to its prevention is the removal of filth and the practice of "local sanitation" in the limited sense of the term. Actual observation and experience of the health officers of infected districts show that such an opinion cannot be sustained, and that small-pox may occur in houses that are perfectly clean, but that the liability to its occurrence is increased by the presence of filth. In this instance the filth undoubtedly becomes the vehicle or transmitter of the infectious principle, the *contagium vivum* from the sick to the well. About one half of the local outbreaks in Massachusetts in the past ten years have occurred in paper-mill towns and in the families of persons who worked in the rooms in which rags were being sorted and cut. These rooms are usually very dusty, and in nearly every instance it has been found that the rags were collected in some large city of the United States in which small-pox had recently prevailed. In two instances the man whose duty it was to feed and tend the dusting-machine was the first to be attacked with the disease. In this case the presumption is very strong that the filth or dust of the rags was simply the medium of contagion, the bales having probably contained rags which had had direct connection with patients suffering with small-pox.

In the same category may be placed *anthrax*, which in most parts of the United States is a disease of rare occurrence.*

* In four years (1867-70) 56,000 horses, cows, and sheep and 528 human beings

The whole number of registered deaths in Massachusetts from this cause in the past 48 years was 98, or an average of about 2 per annum. The greatest number in any one year was 9. At least 14 of these deaths occurred in one small town, in the operatives in a single industry, and when this factory was removed to an adjoining town the occasional outbreaks followed its removal to that town. Of the other cases the greater number occurred in towns where the business of tanning hides was conducted. Of four cases which have come within my notice while in practice, two were in men and two in women; two were fatal—the two women; in these the lesion was on the head. In one of the others the lesion was upon the angle of the lower jaw, and in the other upon the hand. No connection could be traced with any infection in either of the women, one of whom had been engaged in the handling of rattan from Singapore. One of the men lived in a town where foreign hides were tanned, but did not work in a tannery; and the other man, who was infected upon the cheek, was employed in the unloading of South American hides in Boston. The exact relation of these cases to the presence of filth may not at first seem clear. In those cases which occurred at Walpole, as reported in the Transactions of the Massachusetts Medical Society, and in the second report of the State Board of Health of Massachusetts, the persons attacked were operatives in a factory in which hair from Siberian or South American horses * was received in bales, opened, sorted, and curled for use in the manufacture of mattresses. In the room in which the hair was sorted, occupied mostly by women, the air was charged with dust, and no special means for ventilation were provided for their protection. Is it strange, therefore, that this dry filth floating in the air should at times receive a dose of infectious matter, the *materies morbi* of anthrax, since it is known that such hair is not only shorn

died of this disease in one district of Russia (Virchow's Archiv. d. 54, p. 262).

* It is not strange that the infectious principle of anthrax should survive long voyages across the sea, since observation has shown that it is one of the most resistant of all germs to the action of destructive agencies. This permanence of the anthrax germ was well known as long ago as 1769. Fournier states that the poison retains its virulence for many years (Observations et expériences sur le charbon malin, 1769).

from the manes and tails of living animals, but also occasionally from those which have died of anthrax?

Anthrax pustules, according to Virchow, occupy chiefly the exposed or uncovered parts of the body (in the ratio of eighty-four per cent). In this factory, however, cases of internal infection were found to be of common occurrence. Such a mode of infection appears reasonable, since it was known that the operatives had for several years been accustomed to partake of their luncheons in the dust-infected atmosphere of the sorting-room—the dust undoubtedly, in this case, being the vehicle or medium of contagion.

Another disease which recent inquiries show quite conclusively to be propagated through the medium of a dust-laden atmosphere is that most destructive of all diseases—*phthisis*. The danger which exists in the distribution of the dried sputa of phthisical subjects cannot be overestimated.

Dr. Marfan, chief of the medical clinic of the Faculty of Medicine of Paris, gives the details of a localized epidemic of phthisis, which is at least very significant as bearing upon this question of infection through the medium of dust.*

In an important business house in the centre of Paris, 22 persons were employed about 8 hours a day. One of them, aged 40, employed at this place for 24 years, had been phthisical for 3 years, when he died on the 6th of January, 1878. He coughed and spat upon the floor for 3 years, and did not leave his work till 3 months before his death. From that time out, of 22 persons employed, 15 have died. One only died of cancer; the remaining 14 died of pulmonary tuberculosis. One year before the death of the first person, who appears to have been the starting-point of the epidemic, two employés, who had been connected with the same business for more than 10 years, began to cough and spit upon the floor. They died in 1885. Beginning with the end of 1884, the deaths followed each other at closer intervals.

Dr. Marfan states the conditions of the apartment in which these persons were employed. It was small, and the cubic air space was less than ten cubic metres (350 feet) to each person. It was badly ventilated, badly lighted, and the gas was burned a part of each day, especially in winter. The floor was of

* *Revue d'Hygiène*, 1890.

wood, uneven, cracked, and very dirty. The first victim of phthisis and those who followed spat directly on the ground, and the sputa, becoming dry, were converted in this already unhealthy apartment into a poisonous dust. The room was swept each morning, and sometimes the employés arrived before the sweeping was finished and while the dust was still floating in the air. It was difficult to sweep the room thoroughly, since the tables were fixed to the floor. It appears very probable that the swallowing and inhaling of this tuberculous dust was an essential factor in the propagation of the disease.

The proprietor of the place where the deaths occurred removed and burned the floor, and so rapidly was the work done that the reporter had no time to collect a sample of the dust from the cracks in the floor for the purpose of experiments upon animals. A new floor was laid, which was waxed, and treated from time to time with spirits of turpentine; all painted surfaces were repainted; and Dr. Marfan recommended that the floor should be swept in the evening after the departure of the employés, and that the windows should be left open all night.

Dr. Vallin recommends in place of these measures a mixture of equal parts of coal tar and spirits of turpentine, or of paraffine dissolved in warm petroleum, and in place of the sweeping, the removal of the dust by sponges or cloths moistened with an antiseptic solution.

This dried sputa mingling with the dust of apartments, cars, factories, and schools is inhaled by others, and thus the disease is transmitted from the sick to the well. Undoubtedly there are other modes of infection in this disease. In 1866 I saw a flock of twenty fowls who were allowed to devour the sputa of a consumptive. All of them had cough, wasted, sickened, and finally died with marked symptoms of phthisis. Recently several prominent observers have taken the position that inheritance has no influence in the production of phthisis. This appears to be a narrow view, and one which is not borne out by observation. I can certainly see no reason why the parents may not transmit to their offspring a greater or less susceptibility to infection by the bacillus tuberculosis.

The liability to infection by *scarlet-fever* is undoubtedly in-

creased by the presence of dust, since the contagious principle of this disease, so far as can be learned, exists largely in the particles of dried epithelial scales, which, falling from the body, mingle with the dust of apartments, and thus spread the infection from the sick to the well.

In the same category may be placed *typhoid-fever*. In fact, this disease may properly be styled the chief of filth diseases, not, however, in consequence of its fatality or its prevalence, but on account of its peculiar modes of propagation and spread. It would be a work of supererogation to enumerate in detail before this association all the evidence in support of the spread of this disease through the contamination of water supplies, milk supplies, and other media by the excreta of those who are sick with typhoid fever. Nor is it pertinent to urge that many cases occur in which such contamination is not disclosed by careful investigation. It is sufficient to say that in many great epidemics, like those of Caterham and Plymouth, and also in multitudes of smaller epidemics which have occurred in connection with private water supplies and milk supplies, the chain of evidence, although rarely completed by the finding of the typhoid bacillus *en route*, as one might say, from the ileum of the sick to the oesophagus of the well, whether by the medium of a glass of water, a cup of milk, or a cup of tea, coffee, or any other drink in which either milk or water are used, is such as would rarely fail to produce conviction in the minds of a jury of experts. The experiments of Dr. Cory, of the Local Government Board of England, proved that infinitesimally small quantities of filth—that is to say, specific filth, the excreta of typhoid patients, while sufficiently abundant to endanger a water supply, were not within the range of chemical analysis to detect.

Recent experiments in filtration would also cast some doubts on the power of typhoid excreta to infect wells where a very considerable stratum of gravel or sand intervened between the polluting source and the well. Such experiments show that the danger of such transmission of bacteria through sand or gravel is greater when the filtration is continuous than when it is intermittent. Where such infection has been known to exist, it would appear probable that there was either some direct contamination by surface flow, or by means

of underground connection with the water-table. One of the early observed epidemics—that of Lausanne, in Switzerland—has occasionally been misquoted by saying that the polluted water passed through a mile of soil. Experiments with salt and with meal showed that there was an underground current or passage through which the dissolved salt readily flowed, but there was a sufficient barrier to obstruct the particles of starch in the meal; the observer, Dr. Hägler, suggesting that possibly smaller micro-organisms might have found their way through the slight barriers which existed.* Liebermeister says of this disease: “Daily observation is sufficient to show that the decomposition of organic substances and of excrementitious substances is not of itself sufficient to produce typhoid-fever. There are multitudes of houses in which the effluvia of the privies can be smelled through all the rooms, and in which the inhabitants are constantly inhaling sewer gases; and neither the temporary nor permanent residents are attacked with typhoid fever.”

“Cities with defective sewerage are not by any means always visited with typhoid. It can readily be seen that there is no relative proportion between the frequency of typhoid-fever and the want of cleanliness in different cities; the dirtiest cities may be exempt and the cleanest attacked. There are villages and there are certain quarters in cities where, both within and without the dwellings, decomposition of organic and excrementitious substances is constantly going on; but only in some of these situations does typhoid-fever occur, while in others it has never been observed within the memory of man. But in such places the introduction of a single case of typhoid will often give rise to a severe epidemic. . . . We are, therefore, forced to the conclusion that, besides external conditions favorable to the development of the typhoid poison, something else is necessary. Numerous facts render it more than probable that this something necessary is the specific poison itself. In other words, the poison of typhoid-fever does not originate in filth or decomposing substances, but finds in them a favorable ground for its growth

* “Und das Erdfilter, das fein genug ist, Stärke mehlkörnchen, zurückzuhalten, hat die Typhuskeime durchgelassen.” (Deutsches Archiv für Klin. Med. XI. 1873.)

and multiplication. The most convincing experiences show that typhoid-fever never originates in any unusual amount of decomposing matter nor from any circumstances favorable to decomposition, but is always preceded by the introduction of a case of the same disease."

[Since the foregoing was written the writer has had opportunity to make inquiry as to the cause of increased prevalence of typhoid-fever in the cities of Lowell and Lawrence, the result of which illustrates the position taken in this article. During the four years ending with 1889, the cities of Lowell and Lawrence have had a constantly high death-rate from typhoid-fever, amounting to 10.3 per 10,000 annually of the population for Lawrence, and 9.5 per 10,000 for Lowell, as compared with a death-rate of only 4 from the same cause in Boston, and 4.5 as the average of the principal large cities of the State. The cause of this increased prevalence in Lowell and Lawrence is undoubtedly to be found in the peculiarity of their water-supply, which is taken from the Merrimack River. Upon this river and its tributaries above Lawrence and Lowell are situated the cities of Nashua, Concord, Manchester, Fitchburg, and other towns having a total population of 230,000, a considerable part of which is connected directly with the river by means of sewers. That favorable conditions are thus presented for the propagation and transmission of the specific poison of typhoid or enteric-fever, from the excreta of the sick into the river and thence to the water-supply of Lowell, and thence to the population of that city can scarcely admit of doubt. Nor can there be any doubt that the sewage of Lowell, carrying typhoid excreta from its own population, infects the water-supply of Lawrence, nine miles farther down the river. Eight miles below Lawrence is Haverhill, in which the mortality rate from the same cause was less than 5, but Haverhill does not take its water-supply from the river.]

The evidence that *cholera* is propagated by sewage-polluted water supplies is very strong; and that it should be endemic in India, where the defilement of public water supplies is a matter of habitual occurrence, is only what might be expected. Even in India improvement has already taken place in this direction in cities where water supplies have been obtained from new localities hitherto unpolluted by sewage, as at Madras.

Similar observations were made in London in 1849 and in 1854, where the case of the Broad Street pump offered convincing proof of sewage pollution. In Breslau in 1832 the

closing of a polluted well was soon followed by rapid decline of the disease. In support of the same view, the mortality from cholera in Boston in 1832 and in 1849 was severe; in the former year the city had no public water supply, and obtained its water almost exclusively from wells sunk in a soil polluted with the filth of two centuries. In the latter year (1849), when 611 deaths from this cause occurred in Boston, a public water supply had been introduced only eight months before the appearance of the disease, but its general use was confined to the better portion of the city, in which the disease did not appear. In the epidemic of 1854 the deaths in a larger population (from the same cause) were but 261; and in that of 1866 there were but 11. Undoubtedly a more efficient quarantine has accomplished much toward preventing the introduction of cholera into the United States, since, while it has frequently occurred in transatlantic countries, we have been entirely exempt since 1873.

The method by which the choleraic poison finds access to the human body appears to be not unlike that which is characteristic of typhoid-fever; and so far it is a filth disease, in that filth and filthy water form an essential soil for its propagation. In this statement we cannot ignore the possibility of its transmission by means of the air, by clothing, or other media.

In the case of *yellow-fever* there appears to be evidence that the accumulation of filth or excreta about dwellings, over-crowding, and water pollution are conditions favorable to its propagation, and in this sense it is also a filth disease. Undoubtedly the excreta and possibly also the vomitus of the sick constitute important factors in its production. Here also the introduction of the disease into any locality from without appears to be essential to its propagation, and the arrival of a ship from an infected port is usually the signal of its introduction. Hence the importance of an efficient quarantine against infected ports.

The relation of *diphtheria* to filth is not so clear as in some of the other infectious diseases. It is often claimed that it originates in filthy drains, in cesspools, and in sewers, and that the so-called sewer-gas is the common cause of the disease. That such filth may be a proper soil for the cultivation of the

disease when once introduced I think there can be but little doubt; but the claim that the disease originates in them is open to question. Of its infectious and directly contagious nature I have no doubt. A long experience in several serious epidemics convinced me of this. Another characteristic appears to be the permanence of the infectious principle in houses and apartments once infected.

Upon this point Oertels makes the following statement:

"Epidemics of diphtheria are characterized by the slow extension of the disease, which may often remain confined to a sleeping apartment, to one floor, or to one house. Again, the diphtheritic contagion shows itself in the tenacity with which it clings to certain places, rooms, and houses, and in the fact that it can occasion *sporadic* cases in those places after the lapse of months."

With reference to its origin in sewer gas and defective plumbing, the following inquiry was directed to be made last winter by the State Board of Health of Massachusetts. In a city in which diphtheria was epidemic, 100 houses were selected for examination and inspection. A recent and quite severe epidemic had prevailed, in which there had been 174 deaths from diphtheria in the course of the year (1889). Fifty houses were selected in which cases of diphtheria were known to have occurred within 12 months prior to the time of inspection; 50 other houses were selected in which it was known that no cases of diphtheria had occurred during the previous five years. In general terms the houses of the latter class were as nearly identical with the former in their location, construction, and the social condition of their inmates as possible. On inspection the actual sanitary condition of these houses was found to differ but little in the two classes. Defects of plumbing, want of proper traps, leaks in drain pipes, and other similar defects were found about equally in the two classes. Not one of the 100 houses had special provision for ventilation. In one point only did there appear to be a marked difference in the two classes, and that was in the ratio of damp cellars. In the houses in which diphtheria had existed the ratio of damp cellars was as 8 to 5 when compared with the houses of the other class. I believe this is in accord with the observations of others to the effect that where diphtheria has

once been introduced from without it finds in dampness a congenial soil for its propagation.

If it is desired to trace the course of an epidemic of diphtheria amid the mazes of a densely crowded city, there can be no more difficult task imagined. The daily influx and efflux of population to and from the suburbs, the thronging of people in shops, markets, factories, steam-cars, horse-cars, and electric-cars, the crowding together at lectures, church services, entertainments, theatres, and finally in the public and private schools, give the best facilities for the spread of epidemic disease. On the other hand, isolated communities occasionally present excellent opportunities for the careful study of the methods of spread of such an epidemic disease as diphtheria. Such a case presented itself to my notice during the past year. A quiet old town in Berkshire County, near the source of the Farmington River, has comparatively little connection with the outside world. It is 18 miles from the nearest railroad, has no hotel, and has but little regular traffic with neighboring towns. In the spring of 1888 a school-teacher, a native of this town, was employed as teacher of a school 25 miles distant. At the close of her term of teaching in June, 1888, she went home ill, her illness proving, on her arrival home, to be diphtheria. Within the next six months cases occurred in the immediate family of this young woman and those of her relatives, no quarantine having been enforced. It spread across the street to the house of the family physician. Several deaths occurred in these two families. The family of the physician was shattered, and he left the town, his house being abandoned and vacant for several months. The postmaster of the village was also the village grocer. People went to and from the post-office from the first infected house, and the grocer also made frequent visits to the house with his groceries. His family was next attacked, and so severely as to be broken up and scattered. After the house of the village physician had remained vacant several months, and some inefficient attempts at disinfection had been practised, a new physician moved into and occupied the vacant house. Soon after moving in his children were attacked. A lying-in woman whom he attended, together with her seven-year-old boy, were both attacked. A neighbor who called upon this woman was next attacked; and so the-

history of this epidemic could be traced from house to house and from one individual to another for a period of 18 months or more. The houses of these people which were visited did not appear to be especially filthy, but in two or three instances excessive dampness of the neighboring soil was noticed. In the case of the physician whose family was attacked after moving into the house which was formerly infected, the permanence of the diphtheritic germ appears to be illustrated. This history of successive outbreaks occurring in one house after the lapse of a long interval is not uncommon. Dr. Thursfield, at a conference of medical officers of health in England in August last, gives special prominence to this fact, as well as to that of the probable connection of structural dampness of habitations with diphtheria (*Public Health*, September, 1890). He also calls attention to the investigation of Messrs. Roux and Yersin, who found that the diphtheritic germ, if protected from the air and light, might be kept an almost indefinite period, and still produce characteristic symptoms in animals inoculated with it.

The history of the disease in the small town to which I have referred was that of introduction from without, and then of continuous infection from one person to another through the public schools, the unwise visits of inquiring friends, the usual household visits of the grocer, the want of care on the part of the attending physician, and many other similar avenues of communicability. Undoubtedly the isolation of the first case, with careful disinfection, would have arrested the disease and prevented this sojourn for many months, with its train of suffering and death. This is by no means a solitary case; it is simply the history of hundreds of others which are of constant occurrence.

The following statement of the Board of Health of the City of Boston, in its report for the year 1889, is pertinent as to the causes and prevention of this disease :

" It is an interesting fact that the disease has not been particularly prevalent in the crowded and imperfectly drained portions of the city, but has been fully as prevalent where the sanitary conditions are comparatively good. This would seem to prove that crowded tenements, imperfect drainage, and poor hygienic surroundings, although important factors in causing the prevalence of the disease, are not the whole

cause, but that contagion, not only from mild and unrecognized forms, is the most important factor."

In summing up the foregoing observations, and in attempting to answer the inquiry, "What constitutes a filth disease?" we may reasonably conclude that a filth disease is one in relation to which filth in some form or other, either wet or dry, plays the part of an important factor only in its causation, but is not itself the direct cause; that it acts either as a favorable soil for the propagation of disease germs (other favorable conditions also existing), or that it acts as a suitable medium or vehicle for the transmission of the particulate contagion from the sick to the well, as is probably the case in the inhalation of the bacillus tuberculosis in and with the dust of filthy or ill-ventilated apartments.

We may also conclude that the filth which promotes the spread of infectious diseases is *specific filth*, and hence the necessity of removing all filth is that thereby we are sure to remove the specific filth, or that which contains the germs of infectious disease.

The point which I desire to emphasize in the foregoing paper is, not that the removal of filth should in the least degree be discouraged, but that when done it should be done intelligently and with this principle in view; that filth is a condition rather than a cause; that it is the soil for the culture and transmission of infection, and not the infection itself; and just so far as the principle of infection is deprived of its proper soil, so far is one of the most important conditions of its growth and propagation removed.

In the field of sanitation, the careful watching for and providing against the introduction of infectious disease, the isolation of the sick, the disinfection of houses, clothing, and other associated material, are as essential as the removal of that other condition to which your attention has especially been directed.

CURABILITY OF AND IMMUNITY FROM INFECTIOUS DISEASES.—We seem to be progressing toward the conclusion that there are certain CONTROLLABLE conditions of the blood that render certain pathogenic bacteria powerless to affect the organism. Whether or not this power is due to the presence of "defensive proteids" or "bacteria-killing globulins," or

some other factor at present undiscovered to the practising physician, the outcome would be the same. The possibility of curing acute infectious diseases seems to be less doubtful than formerly.—*Boston Medical and Surgical Journal*, January 15th, 1891.

"ANOTHER NEW PRODUCT," quoth the *Tropical Agriculturist*, and this time from a curious quarter—viz., the upas or upas-tree, of evil fame—the very devil, indeed, of the vegetable kingdom—long supposed to destroy every living thing that came within its reach. Who does not remember his granny speak with bated breath of how condemned criminals were sent to report upon these trees till the ground was strewn with their bones, for "man, nor beast, nor bird, nor fish could live for twal miles around"? But modern research makes sad havoc of our cherished fables. Like its spiritual prototype, the upas has been found to be not so black as painted; on the contrary, a closer acquaintance revealed the fact that it belongs to a most respectable family—a very near relative of the cow-tree (*Brosimum*), which yields milk as luscious and wholesome as any Alderney, and a first cousin, at least, to the famous bread-fruit-tree (*Artocarpus*). In short, the upas has been maligned; it is not the *cause* of the malaria around it, but the *cure*, the seeds being found very beneficial in both fever and dysentery. Commercially, however, the tough bark is the most valuable product. In Ceylon this is made into strong ropes. In Western India the upas is known as "Sackin-tree," the inner bark being extensively used as natural sacks for rice. And listen, oh tailors on strike! This vegetable sweater—heedless of trade unions—works night and day in producing ready-made clothes! The felt-like bark removed entire, forms splendid seamless suits—the trunk furnishing bodies, the branches sleeves or legs, as the case may be. If really fine raiment is desired, the material is rolled and dyed, when it is fit for any "masher." Costumes of this natural cloth have attracted much attention at recent exhibitions. There seems also a likelihood of the fibre being found admirably adapted for paper making. Can men be said to be poor who live in a country where bread and ready-made clothes grow on trees, and where gallons of toddy gush out by simply tapping the flower spathes?

TRANSACTIONS OF THE SEVENTH ANNUAL
MEETING OF THE AMERICAN CLIMATOLOGI-
CAL ASSOCIATION, HELD AT DENVER, COL.,
SEPTEMBER 2, 3, AND 4, 1890.

DISCUSSION.*

Dr. Solly: During a practice in Colorado extending over nearly sixteen years I have seen and treated quite a number and variety of nervous cases. The views I have formed from this experience agree with the conclusions Dr. Eskridge has arrived at from his wider experience and knowledge as a specialist of nervous diseases.

Concerning tubercular meningitis, in the one hundred and forty-one cases of consumption I reported to-day, there were only two with this complication. In both of these there was improvement in lung symptoms, and a general apparent improvement up to the time of the fatal attack of tubercular meningitis. I only remember two other cases of tubercular meningitis in my own practice among adults. I also fail to recollect more than one child of consumptive parentage who developed this disease. This one I saw in consultation. The child was a year old and born after the parent developed phthisis.

Dr. Denison: It may be of interest in the same direction that Dr. Solly was mentioning—I don't know whether the number is an extravagant one for the number of patients I have seen, but I am inclined to think it is—but I have seen seven cases of death by tubercular meningitis, all consumptives. Most of these were of a fibroid nature, and the phthisis seemed to be arrested; nevertheless, they died of tubercular meningitis. The fact that Dr. Solly mentions was also true in those cases; the lungs had been improved. It is my idea, had the lungs not been improved the disease would not have manifested itself as far as the nervous system is concerned; in other words, they would have died of the lung disease. Ventilation

* On Dr. Eskridge's paper, preceding number.

of the lungs led to healthy activity of the lungs, but the germs were still in the system, and manifested themselves in the brain through some temporary excitement, or some other cause for meningeal inflammation.

Dr. Eskridge: I would like to say that the form of tubercular meningitis I refer to especially is the tubercular meningitis of the child of consumptive parents. It is an interesting point to determine how consumptive patients frequently die in Colorado from tubercular inflammation or infiltration of the membranes of the brain. It is well known by physicians practising in the East that not a very small proportion of consumptives there die from tubercular inflammation of the brain-membranes. I know in my wards in the hospitals in Philadelphia, during each winter there would be an average of about twelve beds devoted to the care of consumptives, and usually we had from one to three deaths each winter from tubercular inflammation of the brain or its membranes.

I do not think that tubercular meningitis in the child is as frequent in Colorado as in the Eastern cities.

ACCLIMATION OF THE CONSUMPTIVE TO THE CLIMATE OF COLORADO.

By DR. H. O. DODGE, Boulder, Col.

IN treating this subject the exact definition of the word acclimation will not be held ; for persons in health who come to this land of sunshine do not, as a rule, require any process of adaptation, or change of habits as to clothing, food, or shelter, to enable them to survive and flourish among our mountain resorts ; nor are we remote from the life-long residence of a majority of those who seek a new lease of life in the pure air that surrounds our plains and mountains.

Some, however, find it necessary to be very circumspect in taking exercise or doing severe labor at the higher regions of our mountain system until they become accustomed to the low density of the atmosphere that obtains at the higher altitudes.

To a large majority who come to Colorado there is experienced a feeling of lightness and buoyancy in all their movements when not carried beyond the point of physical endurance. The respiration and circulation are accelerated ; the chest expansion is increased ; there is a desire to draw in long, deep draughts of the invigorating air, and a feeling of strength and stimulation pervades the individual.

The ability for continuous exercise or labor can only be measured by the capacity of each person. At an altitude of 5000 or 6000 feet above the sea level a large majority can do full manual labor or take any amount of exercise, while the exception noted above is occasionally met with.

When fatigue follows exercise, the vital powers are fully restored by a short period of rest.

At or above timber-line even the most robust find it necessary to rest frequently. The strength is soon exhausted, but is as promptly restored by an interval of quiet.

The acclimation of the individual consists in overcoming these conditions of altitude and low density of atmosphere,

and in acquiring the ability to do full labor or take continuous exercise without detriment to the system.

The diminished heat at this and higher altitudes, together with the increased tissue changes consequent on the accelerated circulation and respiration, creates an increased demand for food ; hence the Coloradan, especially the mountaineer, is blessed with a keen appetite and vigorous digestion ; and while his store of adipose is usually small, his muscular powers are, as a rule, above par.

The cool nights enable every one to secure refreshing sleep, which restores any loss of vitality from mental or physical labor, and invigorates the system for new efforts.

The dryness of the atmosphere enables one to withstand changes of temperature without inconvenience, that in more humid climates would be detrimental to health, or even dangerous to life.

Many other characteristics of climate and environment might be mentioned did time permit or our pose demand.

Others have written in glowing terms of our almost constant sunshine ; the grand and awe-inspiring mountains and cañons ; the beautiful and ever-changing scenes that are constantly passing in review ; the pleasures and excitements of hunting and fishing ; the allurements of hidden wealth and the possibility of acquiring a princely fortune by some fortunate venture. These are all matters worthy of careful consideration. But above all these the new lease of life that is possible to the consumptive by a residence along the foot-hills or among the mountains of Colorado is sufficient reason for us to recommend our State to this unfortunate class as one of the most favorable spots on the continent in which to recuperate lost energies, combat the dread disease, and live out a longer measure of life. In nearly all cases of consumption which seek this climate, the effect of altitude and low density of the atmosphere will be noticed by the inability of the patient to carry on a satisfactory respiration and take any form of exercise. Even walking a short distance is impossible at first with many, and it takes longer to become accustomed to the new conditions than in health.

The effect of altitude and low density of the atmosphere on the organs of respiration and circulation must be carefully

judged of in each case, as these effects will form the basis of location of the individual, whether he will be advised to remain on the plains, along the foot-hills, or sent to the higher resorts. The acclimation of the consumptive to the climate of Colorado in the sense used here means a gradual improvement in all his symptoms as a consequence of his new surroundings.

The respirations, as in health, are increased in number each minute ; the circulation of the blood is more rapid ; the chest expansion is greater ; a larger supply of oxygen is furnished the blood, which, in turn, gives an increased vitality to the tissues. The lowered temperature and rapid tissue changes create a demand for more food, hence there is a better quality of nourishment furnished the body, though there may be no increase in weight.

As the process of acclimation goes on, the patient notices a gradual decrease of cough and expectoration. If chills, hectic and night sweat have prevailed, they shade off into a memory of one of the ills that induced a change of residence.

General vigor and desire to act take the place of lassitude and enervation, and new plans for business or pleasure are formed. This process may be slow, yet result in complete restoration to health.

CONSUMPTIVES CURED.

There is no registration or means of knowing the actual number of consumptives who come to Colorado, hence it is impossible to make an estimate of the proportion of all cases who are thus benefited. I might, however, tabulate upward of 200 cases which have come under my personal observation during the past 19 years, who have been so materially benefited as to enable them to embark in business pursuits, and begin life anew.

This aggregate of cases who become acclimated to our climate, and thereby cured, may be divided into three classes —viz :

First, a few who are absolutely cured, and who may go to any part of the world, or engage in any business and enjoy an immunity from consumption. Second, those who may go to lower and less favorable climates during certain selected sea-

sons of the year. Third, those who cannot with safety make any change of climate.

According to my own observation and recollection of cases, the first class consists of about 4 per cent; the second class, which includes the first, about 50 per cent, and the third class about 50 per cent.

I will cite two cases of the first class to illustrate the possibilities of a cure under very unfavorable conditions. One was that of a man aged 28, who came under my care in February, 1872. He had just experienced a profuse hemorrhage. There was a regular recurrence of chills, hectic and night sweats; this was the second severe hemorrhage in the history of the case, although he had expectorated blood several times. Patient was raised in Pennsylvania; had worked beyond reason in his desire to accumulate property; repeated exposure resulted in pneumonia; got up before full resolution had occurred; cold followed cold until a general prostration and hemorrhage called a halt. He was advised that his condition demanded a change of climate. There was, in addition to above symptoms, a general infiltration of the upper lobes of both lungs; in the left a large cavity, profuse expectoration of characteristic material, dyspnea on exertion, no appetite, and rest interfered with by cough and perspiration. Vigorous measures to combat unfavorable symptoms were instituted, and an almost constant out-of-door life during the spring, summer, and autumn months was followed by a perceptible improvement. In the spring of 1873 he purchased a small business, to which he gave a part of his time, the remainder being spent in the open air.

In 1878 the last examination was made, and it was found difficult to believe that the strong, florid man before me was the one whose pale face and skeleton frame had caused so much solicitude five years before. This patient was not allowed to go into the mountains for five years, every indication being, in my opinion, such as to render a higher altitude and lower density of atmosphere not only undesirable, but absolutely dangerous. Since the date of my last examination, he has been East, South, and West, and is now engaged in business on the Pacific coast, and considers himself in perfect health.

The second case is that of a clerical gentleman who left college with failing health at the age of 23. He took a charge, but increasing prostration with partial aphonia forced him to resign. Came to Pueblo in 1879 and undertook to preach, but complete aphonia compelled him to suspend work. Came to Boulder to visit a friend, and was persuaded to stay. On examination I found general infiltration of the upper lobes of both lungs with tubercular deposit, with a chronic laryngeal and bronchial inflammation. Aphonia was complete. There was a chill between twelve and one o'clock day and night, followed by hectic. Copious perspiration was sure to follow sleep, and exhaustion was becoming more pronounced daily. There was no cavity, never had suffered from hemorrhage; cough was hoarse and of a bronchial character; expectoration free, but less profuse than in preceding case. His family history showed a sister, brother, and two aunts who had died of consumption; extreme despondency marked every look and action. The unfavorable symptoms were combatted and efforts made to assist assimilation. For fully eight months he barely held his own, after which a slow but progressive improvement began. The waxy countenance assumed a healthier hue; the emaciated form began to round out; with these changes the patient manifested an interest in himself, and hope returned; medicines were discontinued, and an outdoor life adopted.

In the spring of 1882 he travelled extensively in the mountain parks and over the range, and for the next four years roughed it in good earnest.

In 1886 I did not at first recognize a typical-looking cowboy who requested me to see if I could find any improvement in his lungs. The most careful examination failed to reveal any but the normal murmur over every part, while his general appearance emphasized his assertion that he was entirely well. He went to Philadelphia, and while there was examined by two eminent medical men, each ignorant of his past history and of the examination of the other, both of whom pronounced him sound. While on this trip he married, and is now living in Tennessee, engaged in following his chosen profession.

Cases in the second and third classes are to be met with all over the State, and need no illustration here.

There is no doubt that the percentage of acclimated cases would be much greater if consumptives would seek this climate at an earlier stage of the disease than a majority of them do. So many come to Colorado at a sacrifice of all their possessions, after every reasonable hope of even temporary relief is gone, only to perish on the threshold of the promised land, that many who are still in a condition to receive benefit are deterred from coming. I believe that many physicians of the East are not sufficiently discriminating in advising their consumptive patrons where to seek a change of climate, nor can they be familiar with the conditions that prevail at the altitude of the Rockies. If they were, the spectacle of a consumptive dying in transit from station to hotel would not be seen, nor would so many succumb during the first or second months of their sojourn in Colorado.

DISCUSSION.

Dr. Ingals: The author of the paper mentioned one point incidentally that did not correspond with what I have observed, either personally, or what my patients have observed, and that was that people coming to this high altitude sleep well. I do not know what the version of those who sleep well is, but I have known of a good many that sleep poorly. Possibly the gentleman might give us some idea what induces those to sleep who cannot sleep well, and what kind of patients can sleep and what kind cannot.

Dr. Dodge: I mention in the first part of the paper, in regard to those who come here in health, that they universally sleep well, and my experience is this class of cases who become acclimated, according to the idea of the paper, as a rule sleep well. There are many who do not sleep well, and a large number who do not in any sense become acclimated, according to the sense of this paper.

ON THE RETURN OF CURED TUBERCULAR PATIENTS FROM HIGH ALTITUDES.

By FREDERICK I. KNIGHT, M.D., Boston.

CAN patients in whom tubercular disease of the lungs has been arrested in high altitudes return with safety to low ones?

The brief remarks which I have to offer upon this topic were written with the hope of exciting a discussion which would bring out the rich experience of our Western members with cases of arrested pulmonary disease. It is a common saying in the East, "If you go to Colorado you must live there forever after; you can never return East."

Whence did this idea arise? Because many patients have undoubtedly suffered relapse after coming down from high altitudes. Why did they suffer relapse? (1) Some because they returned too soon, and (2) others because, though practically cured, they returned to exactly the same conditions which produced the disease in the beginning.

When a patient convalesces in a high altitude, after failure to do so in a low one, it is because he has experienced certain conditions (whether of dryness, low atmospheric pressure, or what, it is not my purpose now to discuss) which he had not encountered before.

It ought to be self-evident in this, as in any curative process, that its conditions should not be rudely interfered with before certain definite results are obtained.

Nature has begun her process of restoration on certain lines, and the attempt at readjustment to others, even though they may be in themselves equally good, must be dangerous.

"It is not safe to swap horses while crossing the stream."

In speaking of those who return from a mountain climate too soon, I will not stop to more than mention the innumerable host of patients who flit from place to place, without ever being adjusted to the conditions of any one. They come here, stay a few weeks, find that they cough more (per-

haps this may be the beginning of a beneficent change in the lung), get discouraged, and go on to some other climate without taking professional advice, or, at any rate, without heeding it, if sought.

These patients need that staying power which is so necessary for recovery from such a formidable disease, innumerable instances of which will occur to the minds of every one here present. It is that which keeps them courageous through the almost inevitable set-backs which occur in the progress of the disease. It is that which all experienced practitioners recognize at once in a patient as one of their most powerful allies, and the absence of which weighs heavily on the adverse side in the consideration of prognosis.

There are others, however, who stay in the mountain climate long enough to experience marked benefit from it, who tear themselves away too soon, before the disease is sufficiently quiescent to bear transplantation. The shock may be hardly less than that to a delicate plant moved from one soil to another at an improper season.

It is difficult to bring such a matter as this down to an exact numerical basis ; but it may be said, as a rule, I think, that all patients who have experienced an arrest of pulmonary tuberculosis in high altitudes should stay in them at least a year after the arrest may be fairly said to have been established.

What patients in this case can be allowed properly to go to their homes, and what ones should be kept from them, will be considered shortly ; but, in the first place, let us for a moment consider what may be called an arrest of the disease. In general one may say that an arrest of the disease has taken place when all morbid general symptoms have been absent for a period of from six months to a year, with the following exceptions : A little morning cough with expectoration may remain for an indefinite time after the arrest of disease. The weight may be somewhat less than at a lower altitude, the pulse may be more easily accelerated, and, of course, some dyspnœa on exertion may remain, in proportion to the lung area originally involved. Locally, on physical exploration, one will continue to obtain some abnormal signs, except in cases in which the amount of disease was originally very slight. These are

usually signs of contracted, partially consolidated lung-tissue, with some rather sparse crumpling rales, but not an extensive area of moist bubbling. With these exceptions the patient is well ; feels well, and asks to go home. Whether he should be allowed to go back to a low altitude depends in great measure on how far he will put himself into the same conditions under which the disease originated, and how far he may be able to modify them.

In regions where tubercular disease is prevalent every one is constantly exposed to its reception. That most persons escape it is due to their predominant power of resistance. When any factor which helps to make up this power of resistance fails, or when the infecting agent is suddenly increased in quantity, then the disease is more liable to become implanted. Now, in some cases it will be not difficult to determine what change took place in a patient or his surroundings to produce the disease, and if this can be determined with tolerable certainty, and is found to be such as can be avoided in the future, then we can with more confidence allow him to return.

Those who show a strong hereditary tendency to the disease—in other words, who afford a favorable soil for its growth, no matter how unusual the exciting cause may have been—had better be encouraged to remain in the climate where arrest has taken place, except for such occasional temporary changes as their general condition may seem to indicate. Those having this receptive soil are so extremely liable to fall prey to the disease that any influence which has proved itself beneficent had better be maintained. On the other hand, if the patient has no inherent tendency to this form of disease in himself, but has been the victim, as it were, of external causes, he may be allowed to try a return under different conditions.

CHANGES BENEFICIAL.

What conditions, under which the patient lived when the disease was contracted, can be altered for the better on his return ? In the first place, his residence may have been dark, damp, and on a clayey soil ; this may be changed to one on a dry, sandy soil, and one filled with sunshine. The profession to-day fully endorses the claims of Drs. Bowditch and

Buchanan in regard to the effect of soil-moisture in the production of tuberculosis.

In the next place, his occupation may perhaps be radically changed from an in-door one, necessitating the rebreathing of a vitiated air, laden not only with carbonic acid, but perhaps with other noxious agents, to one which will keep him outdoors the greater part of the day.

Again, if pains were taken to trace back the beginning of cases of tuberculosis we would be often surprised to find how many of them could be reasonably attributed to improper or insufficient diet. Man has not yet been inclined to bestow that care on himself in regard to the quality and quantity of his food, which he has long since been accustomed to bestow on the lower animals. In the case of the animal, man recognizes the economical necessity of bringing him to the highest possible degree of strength. In his own case he tries, by cunning in various ways, to diminish the amount of physical work required of him rather than to give himself the strength to endure it. He shows a total disregard, and usually ignorance of the simplest rules of dietetic hygiene. Sometimes he is aroused to the importance of the subject only to commit himself to some very unsuitable and injurious bill of fare—*e.g.*, an exclusively vegetable diet after a lifelong of meat-eating.

I cannot help thinking that a much greater influence in the production of disease is exerted by the food with which we furnish our bodies than we are accustomed to admit, and that much more is yet to be accomplished for our welfare by its proper management. At present the usual preparation of food is so bad that, after we have found out what nutriment a patient's condition requires, it is well-nigh impossible to secure it to him. I am happy to say, however, that this subject is at present beginning to attract serious attention, and that something like suitable schools of instruction are being established. I hope to see before long schools for cooks established in every large city, where women shall be thoroughly trained in all branches of cooking, and furnished with a diploma when competent. There should be established, in connection with such a school, a bureau of registration, where the subsequent history of each graduate shall be kept on file, available for reference, as in the case of nurses. While I

believe that such a systematic method of instruction can be successfully employed in the case of other servants, I think that the best cooking will be taught in schools devoted exclusively to that, rather than in the schools for general house-work which are now being established. I have dwelt upon this point because I believe there are few families whose average health is not below what it would be with properly prepared food. So, then, by special effort in improving his diet, a decided change may be made for the better in the prospect of continued health of a patient with arrested tuberculosis.

There are also some cases in which mental depression from surrounding conditions is such as to render it fairly liable to the accusation of causing the disease. This may be capable of radical relief.

There may have been some accidental change in the lung, which will make it more liable to infection, which with care we may hope to avoid in the future. This applies, among other things, to inflammatory conditions, to which some are exceedingly prone, while they seldom occur in others. A good illustration of permanent arrest of tubercular disease, perhaps coming under this class of cases, is afforded by a gentleman who consulted me in July, 1876. He was then 29 years of age. His mother had died at 33 of pulmonary tuberculosis, when the patient was two years old. He had never had serious sickness, and was not prone to inflammatory conditions of the air-passages. A year before he had strained his chest, and since then it had not felt quite right. He attributed his symptoms, for which he consulted me, to exposure as a member of a military company which took part at the opening of the Centennial Exhibition the previous May.

He complained of cough, loss of flesh and strength, dyspnoea on exertion, and night-sweats. His pulse was 84. There were signs of partial consolidation and moist rales in the upper lobe of the right lung. I find no record of the temperature in my notes. I advised him to spend the remainder of the summer at Block Island, and if his cough still remained in the autumn, to go to Colorado. I saw him August 29th. He had gained flesh and strength, and the night-sweats had ceased. His pulse was 66. His cough was

worse in the morning, but less in the day. The signs in the chest were less marked, but still evident. I advised Colorado. September 7th the night-sweating returned. He left some time during this month for this State, and I did not see him again till the 19th of the following May, when he presented himself in my office. He returned, I presume, without advice. He stated that after reaching Colorado there was not much change till November 1st; then he began to improve, and cough and expectoration ceased entirely by the 12th of November. He stayed mostly in Denver up to that time, and afterward camped out, and was on the prairies most of the time. He took very little whiskey, but 5 to 15 glasses of beer daily. He started for home on business April 23d. He began to cough as soon as he got east of Kansas, but was not conscious of taking cold. He had gained 22 pounds in weight. He now had morning cough and expectoration, and some cough after meals. His pulse was 78, and temperature 99 degrees. On examination of the chest there was marked improvement, the only morbid signs being prolonged expiration at the right apex, with slight dulness; and on deep inspiration a few clicking rales in right front from top to nipple. Nothing like moist sounds were heard anywhere. I advised him to go back to Colorado, and to stay there. This he did, and remained till March, 1881 (about four years), with only one visit East during that time. Since 1881 he has remained in Boston. Exactly when his cough and other symptoms again disappeared I do not know; but since his return he has never had cough or any other suggestion of pulmonary disease. There was admitted to have been a pretty free admixture of Eastern whiskey with Colorado air in the therapeutics of the latter sojourn in the West. Just what the determining factor in this tubercular invasion was, whether the strain, or the acute cold from exposure, or both combined, is not perfectly clear; but inasmuch as the patient's life in general has since been much the same as before the attack, it seems proper to consider the cause as something exceptional. He came home and remained there on his own responsibility. Considering his hereditary tendency, I should certainly have advised him to stay away from the Atlantic seaboard if I had been consulted.

Finally, the determining factor in the production of the disease may have been exposure to such a quantity of infecting material as could be avoided in the future, if the patient returned home. For instance, such a condition as was reported recently in a counting-house in Paris, where a very large proportion of the clerks had become tubercular, and expectorated upon wooden floors, the sweeping of which was completed in the morning, after the clerks began to arrive.

I have introduced this topic because I feel sure that patients cured in Colorado need not all remain there ; and because I feel that it is very important that they should take competent advice in regard to any desired change, and also that the physician, in case he should allow any to return, should make well-directed effort to diminish the liability to a recurrence of their disease.

DISCUSSION.

Dr. Solly: I was delighted to hear Dr. Knight's view of this subject, which is founded on considerable experience. It is the view I would expect him to take, because it is a reasonable one ; it is exactly similar to the one I have formed myself, and the statistics which I offered the other day I think will show the same thing, how those cases of the character described by Dr. Knight can go and remain East and others that have to remain here.

A thing I might perhaps add is, that my experience is rather pointed out by what Dr. Leonard Weber and other observers in the Alps seem to think, that persons who are cured in high altitudes stand a better chance from further attacks and a better ability to grapple with life at home, wherever it may be, than a cure in a more humid climate ; and physiological reasoning would bear out that method, because the heart muscle is more strengthened. And in those who have a tendency toward weakness, which is common in many consumptives, that danger is eliminated in the future, for the reason that in cases of consumption, as Dr. Knight points out, there are those who may be said to have a natural tendency to consumption and those in whom it is accidental ; and in arriving at actual conclusions on the subject, it takes a great number of cases.

I certainly think we must combat the idea that a cure in Colorado is less a cure than elsewhere. I think it has a tendency to be more.

Dr. Bowditch: Dr. Knight's most valuable paper strikes at a most vital point, I think, especially for us Eastern physicians. Nobody realizes so much as the Eastern physician, I think, the hard work that is to be done in telling a patient that he must go away for trouble in the lungs, in the first place, and more than that, to tell him he never should return even if he recovers from the disease in a more favorable climate.

I confess that my teachings from my earliest medical days, from my father, have been decidedly against the idea of patients returning to Eastern climates if they have recovered in another climate. He said to me just before I left home, "I am very much interested in this question that Dr. Knight is going to speak about, and I am very desirous of hearing what he has to say, and I only wish that I could be there." But he said, "Say for me that my experience has been thus far, that if a patient goes away and recovers he must stay there, because I have had so many cases that have returned apparently perfectly well, and after a residence of a few months in their old home the trouble has returned, and they have gone literally to the ground."

My own experience has not been sufficiently extended to enable me to speak in positive terms upon this question. I can recall several cases where people have gone away and have returned, and have now been residing in Boston or in that vicinity for at least six or seven years and are in perfect health.

Certainly Dr. Knight's experience is most valuable to us, and I think the profession cannot be grateful enough for his excellent paper.

It seems to me that it all points toward this one fact—the fact that more patients can come back than used to in former days; that for some reason or other consumption is no longer the fatal disease it was considered a generation ago, and certainly all we can hope for is to do as Dr. Knight suggests, telling the patient if he does return at some future time, with the lungs healed, he must not take up the life that he formerly led at his home.

Dr. Fisk: Dr. Knight's paper has been one of special interest to me. It is a paper that is of very vital importance to all the physicians in Colorado, more especially those having patients from the East. It presents a subject we have had under consideration for some time—viz., the advisability of letting patients go back East, not only for a permanent residence, but temporarily on visits. It is very hard for most consumptives to come to Colorado. They are apt to be persons of pushing, energetic temperaments, who have broken down in consequence of overwork and enthusiasm; they leave interests behind which pull very hard indeed, and their hope

is, on coming here, that after a few months they will be able to go back again to their old lines of occupation. They are frequently not undeceived in reference to this on coming here ; they are told, perhaps very properly, to go out to Colorado to see what it will do for them, and then it is left for the physician in Colorado to gradually break the news, that they must stay here a greater or less length of time. It has been our boast that Colorado furnished opportunities for persons who had obtained an arrest of trouble, so that they would find fields into which they could throw their energies, as they did East, and having gained and recovered, or obtained an arrest of the trouble, they could live here as men and women, bearing their share in the burden of life. Colorado being a new State, and the avenues still open for all sorts of enterprises, it offers every opportunity to persons who are anxious to work, when they are able to get into such a position. Nevertheless, there are those, strange as it may seem, who, even after a residence of a few years in Colorado, are desirous of returning to old associations and old locations, and the question comes up as to what class of cases we can send back.

Experience in the past has not been very favorable to our sending patients back to the East again. Whether they have been imprudent, and, like a schoolboy turned out on a vacation, have committed some imprudence, some excess, and have brought on a relapse or not, is pretty hard to say ; but a great many cases have gone back from here that have not done well, and have returned to Colorado, going only from bad to worse. Our experience has also shown that where relapses occur the patients do not pick up so rapidly a second time. So we have been very cautious with reference to giving any advice about our patients going back again. A number of years ago this even extended so far that we did not allow them to go back on vacations ; the idea was one of a permanent residence in high altitudes. That stringency has given way in the minds of the profession, and we are now letting a certain class of cases go back for a vacation nearly every year.

Now the question arises as to the proper season of the year in which to let such patients go back, where there has not been a total, but a partial arrest of the disease, where the case is getting on well, the nutrition and recuperative power

good, and no risk of catching cold. For my own practice, I consider the month of September and early part of October the best season in which to permit them to go East. It is the part of the year which I have selected myself for my own trips, but for the last three years I have found that the Atlantic Coast, Massachusetts, and New York were so damp and rainy that I have about given up the idea that October was a good month, even in the East. I know that in 1888, in Western Massachusetts, there were eleven inches of rainfall in September. Of course that is not a good time, if it is common, or anything like that. It is not safe for a consumptive to go from a dry climate to such moisture. Trips back do our patients a great deal of good if they are cautious—if they will keep regular hours and do not dine out too much or go to the theatre. In other words, if they use considerable caution, the change from a high altitude to a low altitude, the change of scenery and the mental change benefits them. When they come back, as a rule, they do better.

Now, in reference to a permanent change, I think that in Colorado most patients who have obtained an arrest of phthisis do well to stay here. We are now very cautious in any case about advising them to go back for a permanent residence. Of late years, in my own experience, some patients have gone back, and I am pleased to say I have in mind now not very many, but some half dozen perhaps, who have gone back that are carrying on the burdens of life in the East; two men I have in mind being doctors, and they are doing remarkably well. And these few cases that are being selected with an especial care lend hope that the avenue will be open after awhile to more going back.

There is one thing which, in my mind at present, is an obstacle and a barrier to a patient's going back, and that is where there is a strong hereditary taint, as in a case where I was consulted recently, in a young man who never had any pronounced trouble in his chest, but lost two brothers from pulmonary trouble; he lives upon a ranch and has perfect breathing apparatus, as far as I can determine. He is anxious to go back to friends and business matters East, but inasmuch as there is this tendency in his family, I have advised against it, and my advice has been corroborated by that of others.

Dr. Rogers: In my experience, the cases in which there is the greatest objection to going back are those that have a tendency to hemorrhage. Wherever there has been the slightest tendency to hemorrhage, though the lungs heal completely, in my own practice I am very slow to allow them to return to a lower altitude.

I heard only yesterday of a young man's death who had been out here in a bank and had returned to Ontario. He returned and was well, but had not been at home six weeks before his old trouble returned, together with the same class of hemorrhages he had had before, and his death followed very rapidly.

As a side question to this, I think the Eastern physicians should always, when they send a patient to Colorado, tell him as soon as he arrives here to place himself in the hands of some competent medical man, and not to return until that man says he is in a condition to do so. Until he knows that the disease is thoroughly over he certainly cannot return with safety. Patients come out; they may or may not consult a doctor as soon as they get here. When they do, they often improve so rapidly that they think they are safe to return under any circumstances, and they often do return without consulting the physician, and in consequence often return too soon. No medical man residing at sea-level can properly advise a patient when he has come to the changed conditions of a mountain climate.

The point of the tendency to hemorrhages is the point of which I wished to speak particularly.

Dr. Eskridge: It seems to me that the subject treated of by Dr. Knight is of so much importance we should not let it go by without discussing it at great length. It is a subject that interests every one of us who comes to Colorado for health. I would like to know from him or others who are able to give any information on the subject whether they have in their experience seen any consumptive coming to Colorado, where there has been broken-down lung tissue—a cavity—who has been able to return East and live permanently there.

I was sent here six years ago with a cavity in the right lung and tubercular infiltration in the left, the right lung being entirely infiltrated at the time. I gained twenty-two pounds

the first two months. I kept on gaining until I gained fifty pounds. I returned in 1887, and Professor Da Costa said he could find nothing except a slight contraction on the right side of the chest ; but when I returned to him two days later he told me that numerous moist rales were present throughout the right lung, and advised me to leave for Colorado at once. I remained two weeks, and in those two weeks I lost just ten pounds ; my expectoration returned, which I did not get rid of till six or eight months later.

I have known of a number who have come to Colorado quite sick, without any breaking down of the lung tissue, who apparently were able to go back and live for periods of many years in the East ; how long they will be able to live I do not know.

I think Dr. Bowditch the elder is right in the general statement, that all patients who come to Colorado and improve, and find the climate congenial to their condition, should not return. This should be the general advice, I think, to every patient, or to the majority of patients ; but there are undoubtedly exceptional cases that seem to be able to return. But it seems to me of the utmost importance that both the Eastern and Western physicians who pay special attention to lung diseases should be careful to discriminate those cases that are permanently able to live East, whether it is a hemorrhagic case or one of any other character that can possibly return East and live there permanently, because it is a great mistake, and a mistake that can never be repaired if it is once made. If a man does return East and breaks down, as Dr. Fisk has just stated, and Dr. Solly corroborated him, with lung trouble, he rarely ever recuperates as well in Colorado as he did the first time. To reiterate, I will say it is of the utmost importance that the physician paying special attention to lung disease should be able to discriminate and tell as nearly as possible which class of cases may go East to live after regaining their health in Colorado.

Dr. Solly: The point with reference to that is an experimental one. When you think it is safe to send your patient East, let him go for a short time, and the duration of the visit is one of the most important things. For instance, there are a very few cases that should remain here less than a year to

begin with ; it is a good rule to start with, and then let them go East on a short visit of one month's absence entirely from Colorado—I mean the whole length of time being one month—that is another good rule. Our experience with patients visiting the East is this : The first three or four weeks does them a great deal of good ; they have the stimulus of seeing their friends, and better food, and change of scene, and all the pleasure and the profit that comes to them of the change. After the first three or four weeks they begin to cough a little and begin to decline ; they don't pay much attention to it, and they go on until they get into serious trouble again. The difference between one month and six weeks' absence is in many cases remarkable. When they come back the next year extend the time to six weeks or two months, if they have had no bad effect from it ; and so, by experiment as well as theory, arrive at what your patient can stand. But the great thing to impress upon those patients is to obey strictly the limits you give them. I nearly always find if you give them an inch they take an ell ; that is frequently the trouble in patients going East. If they obey the strict letter of your injunctions and limit themselves to the very day you tell them to return, you will generally find they will benefit, even within the short limits I suggest with experimental sending East.

Dr. Fisk : We have with us one of the older residents of Colorado, who has had very large experience with reference to the subject now under discussion, and I would like to call on Dr. Bancroft.

Dr. Bancroft : Mr. President and gentlemen, I did not come expecting to make any remarks, and what I say will be mostly from memory. The most notable case that I ever knew of recovering from lung disease was acquired from a gentleman who lived in St. Louis—I have forgotten his name. He came out onto the plains at the age of twenty-three years with a hemorrhage, expectoration, night sweats, etc. He returned to St. Louis, and after a period of fifty-five years he made a visit to Denver ; he was then in his seventy-seventh year, and had been an active business man. The question which perplexes the physicians of Colorado mostly is this, that a patient remaining here for a year or two is anxious to return

to his home for the purpose of making a visit—when shall they go East and how long shall they remain? It has been my experience that in many cases after a residence of one or two years here they gain rapidly for two weeks in the East, often picking up in flesh rapidly, and they have to be charged that, notwithstanding the temporary improvement which they find in the East, they should return, and not remain until the tide turns the other way. I have known many who have returned East and remained and enjoyed good health. Some who seemed to lose rapidly here have gone East into a damp, moist climate by the seaside, have regained their health, and are still living after ten or fifteen years.

Another question sometimes has suggested itself to me. It has been my observation in years past that many of the wives of consumptives come here affected with the disease which their husbands have had. I remember one instance of four men coming here, all of them with strong and apparently healthy wives, and all of these wives within one or two years were affected with phthisis. In such cases, where there is a very long standing phthisis, would it not be advisable to insist upon the families of such consumptives to remain a year or two? I think it would be advisable. I have no doubt others have had the same experience, that the wives of consumptives very frequently return with the same trouble.

Dr. Pitner: I wish to speak a word on the question as to the best time for the returning of phthisical patients to the East. I live in Central Illinois, and the most healthful months of the year are May and June; we have the least mortality throughout the State in those months. Our phthisical patients improve more during the months of May and June than any other time of year, so it occurs to me that it is decidedly the most advisable time for patients to revisit the East. They are not subjected to the severe heat of the summer or to the autumnal changes from rains. We have rains in September and October and changes which are unfavorable. In May and June there is little rain and more equable temperature, and the climatic conditions are more favorable, it seems to me, than any other period of the year. From the middle of May to the middle of June is the best time in the year.

Dr. Rogers: A case has just come to my mind that bears

on the point and may be of interest. A gentleman of education came here this year from Davos. He had resided there for five years. He was sent there from London upon the advice of three or four most prominent physicians. They held out to him only the faintest hope that he could even get there alive. He said he was now one of the show cases of Davos. I asked him, "Why have you done so much better than other patients?" and he said, "Simply because for five years I have never gone down from the altitude of Davos, although for two years they have considered me sound; I have only come down now to come at once to the same altitude in Colorado. I am convinced of the fact that the great secret of the high altitude treatment is a permanent residence in the high altitude. I never want to go down to sea-level again except on such a trip as I have just made of necessity." For two years he has been practically sound. In examining his lungs, I could hardly tell which lung had been the bad one. He is living here now, and is quite satisfied to make this altitude his home for the rest of his life. He says, "The reason the cases do not fare so well in Davos as in Colorado is because it is the rule of the people to go down from there during the summer, when the snows are melting. It is a great deal better to stay there, though the snows are melting, than to incur the danger of going down to a lower altitude and later going up again."

Dr. Denison: For my present purpose, with reference to Dr. Knight's paper, I consider this evidence, as coming from a physician in whom we all have implicit confidence, and one who does not live in Colorado, as of special importance. The prejudice, which I am sorry to say naturally creeps in with reference to the evidence of a man who does live here, cannot apply, and this fact makes the paper of Dr. Johnson, to follow, one of the most valuable records we could have. To my mind, there is nothing to compare with this list of cases.

Let us go over it in a cursory way. As to the cases that did not improve, I think there is a mistake in one, as you will see. In the first list that did not improve the time they were under observation was only five months; that will show you why number four is perhaps cut off from being in another class. The second class which were improved, but not cured

were under observation one year. The third class that were cured were under observation seven years, which is a valuable fact, because that was a long enough time to have the author sure that they were improved. Let us take the seven cases that were not improved, letting the others stand for themselves, and nearly all in the last class were those that went into the high altitude, all of them, I think; and some of them were advanced and had excavation in the apex. Of those seven cases, number four was a case of laryngeal phthisis, and was four months in Colorado; then after he went home he was worse, and he being under observation an average of five months, he goes into the unimproved class. But what happened afterward? After his return East he was worse. Went again to Denver for ten years, and on return began to cough again. A third time he went to Denver, and while he was there he was well; the last time he was heard from he was in the West. That record is added afterward.

Number eight, the next case. He had improved while he was in the West, but five years after he was worse, out in Santa Barbara. The fact that he had gotten worse in a low altitude ought to be remembered with reference to that case.

Number twelve, the next one, died in Los Angeles in four months.

Fifteen, the next one, is somewhat doubtful, because he was in Colorado when last heard from, though the author claims this patient might be one of the cranky ones; he wasn't getting well, yet he was in a fair condition. The doctor remarks he might be mistaken in his own estimate of his case.

In number seventeen, the next one, both lungs were affected, and there was a long delay after that fact was found out before he went West. Such a case naturally might not improve.

Eighteen. Nine months in Denver; thought that he had improved; went back East and died in Chicago.

Twenty-one. Went first to California, and the doctor says in his record that he had no cavity. He had a cavity, however, when he, in two months, returned to Denver. He died in Chicago. I think that is a fair estimate of those cases, and very creditable, so far as Colorado climate is concerned.

I wish to say just a word with reference to Dr. Knight's question that was proposed this morning. As a case I was

examining a few days ago seemed to my mind to bear upon the question, I picked up the record and brought it along. It seems to me that a great many of these patients that go back East and retrograde have themselves to blame for it, and, as Dr. Johnson says, when they once return they do not get the same benefit the second time going West. That the tubercular condition does not do so well on the second visit is generally borne out with my cases.

I would like to read this case, and then say a few words with reference to some that are similar.

August 18th, 1890, , 34 ; married ; eleven years from Canada ; photographer. No inheritance. He had right pleurisy before he was married. Six years ago caught a bad cold, and for six months had inflammation in right lung, night sweats, and afternoon hectic. Was up and down after this. Came to Colorado five years ago, and felt elevation ; weight then 130 pounds ; in health it had been 145 ; now it is 125. At the same time he came he improved and gained 20 pounds in Colorado in six months. Went East and caught cold and lost his 20 pounds. Came back after four months ; was bad off ; did not gain as before ; was raising, and has been ever since. Now he expectorates half a pint in twenty-four hours of yellowish matter ; no night sweats now ; no hemorrhage ; bowels not regular ; better, perhaps, lately ; diarrhoea at times ; skin sallow ; vomits after meals ; will vomit at night if he lies on left side ; feverish in afternoon and chilled mornings ; working in photograph gallery, or has been so, three years ; stooping over makes him cough ; right ankle has been swelling of late ; finger ends somewhat clubbed ; pulse, 96 ; respiration, 24 ; temperature, 100° ; spirometrical record, 80 cubic inches ; height, 5 feet 10 ; expansion 32 and 33½ ; movement more on left, but dulness in both apices in front. A peculiar thing about him, a year ago last May he said he stooped over after pumping water, and he thought he must have emptied as much as half a pint of matter from his mouth. Evidently he emptied a cavity at that time. No succession, but deep-seated hollow sound on stethoscopic percussion in right interscapular region ; no vesicular murmur heard on right ; right base dull and mucous rales in front. Cavernous voice and bronchial wheezing on cough, in large space,

right interscapular showing excavation, or large bronchiectasis. Left—bronchial breathing and fibrosis ; expiration, 6 ; inspiration, 4. Right—expiration, 5 ; inspiration, 4. Diagnosis : Chronic fibrosis and bronchitis, third right and first left, with emphysema and bronchiæ right.

We now see this case in a pitiable condition, but he has lived all this time here simply prolonging his life. If he had not gone East, there is no telling but what he would be as well as a good many of the rest of us who followed a different plan. I find many patients decide their futures themselves, no matter what they are advised by the doctors. They take their own course any way. If I was asked to decide with reference to the cases which could return East, I think I would say, if it is a hopeless case, then it is all right for them to go, but if it is like the case Dr. Knight and I have seen to-day, they can do as they please, for where there is excavation on both sides, the question of going or staying is usually not of importance enough for them to go contrary to their own wishes. Remaining simply prolongs their life or shortens it, as the case may be. But in cases of excavation in one lung, where an arrest is taking place, I should say they should not return to as low a level as where they contracted their disease. Nevertheless, I can instance a lady who lives in Grand Rapids who had remained here three years, after I first came here seventeen years ago, and she is living in Michigan, apparently well, and is quite fleshy, and there was an excavation in the left infra-clavicular space nearly as large as a hen's egg when she left here ; but that is a very exceptional case. She had excellent care, and the disease was arrested. It was not progressive the last year or year and a half that she was in Colorado. Less advanced cases which have been arrested, it seems to me, ought to remain as long, or longer, after they have gone to live in a high altitude as they were in getting into their condition beforehand. The idea of coming out here and expecting to get permanent improvement in three, six, or eight months in a serious case, it seems to me, is questionable—that is, where there is a deep-seated disease or tubercular infection. However, in simple chronic pneumonias and hemorrhagic infractions, a short stay will often do wonders.

Dr. Baker : I would like to say a word on the time when it

would be best to have the patient return, if he returns. The point I wish to make is this : We have before us the results of the experience in some of the Eastern States, and I have presented here the facts relative to Michigan, and we have found there are the least deaths there in August. This is the experience of nine years. Michigan, I suppose, will not be considered the Far East, but might be considered an average Eastern district. Now by reference to this diagram of consumptive deaths in Colorado, the least deaths here occur in July, and by August there has been a very considerable increase, and by September nearly half the maximum. Apparently, then, if the patient could leave here by the time the conditions in Colorado are rapidly getting worse, he could reach the East at a time when the conditions there are favorable.

Dr. Knight : I will simply reply to a few of the questions which were put rather to me than the association generally.

The first one in regard to hemorrhage was put, I think, by Dr. Rogers. The fact which he stated, that certain patients who had a tendency to hemorrhage were apt to have a recurrence of it on a return from a high to a low altitude, was confirmed by the patient whom we saw this morning. She stated to me she would like very much to go down to Southern California, where she had been several times, and where she had gained strength and grown fat, etc., on a visit, but that she didn't dare to do it, because every time her visit had been ended by a very considerable hemorrhage.

One gentleman, I think Dr. Eskridge, asked me if I had ever seen a patient who had recovered after having had cavities sufficiently to return and live well in the East. I should reply to that in the negative, because, in the first place, I never wait long enough to allow my patients to have cavities before I send them here, and in the next place I think the tendency has been with physicians in our region to keep those patients away, where they have known of other recoveries ; so I must say that all of the patients who have recovered in this region, or any high altitude, I have known them only in the early or incipient stages.

To your question in regard to a temporary return, I have selected the months of July and August, because patients then

are less subject to cold and moisture, which, as I said in regard to the mucous membranes, seem to be a bad combination. Of course that is our hot season, but there are places in New England, particularly in the White Mountains, up at Giddings, and other places which are equally well situated and which are sufficiently cool to prevent the loss of strength, that would happen, perhaps, if they stayed down in the lower region.

HAYTIEN FEVER.

SANITARY REPORT U. S. S. KEARSARGE.

By Surgeon A. M. MOORE, U. S. Navy.

Abstract from Report of Surgeon-General, U. S. Navy, 1890.

IT is a difficult matter to find out the truth about the health of Port-au-Prince. This is due, in the first place, to a lack of scientific training among the native practitioners, which renders them incapable of correctly classifying diseases. With them the word "Haytien" is a generic term applied to all the indigenous fevers.

The following description embodies all that could be ascertained in regard to it. "Haytien" fever exists in some form throughout the year. It is variously called, according to its gross symptoms and results, "fièvre bilieuse," "mauvaise," or "peïnicieuse," unless it should happen to be mild, in which case it is called simply "Haytien." The commencement of the disease is nearly always abrupt. If it is ushered in by a chill (which by no means is the rule), this is quickly succeeded by high fever, as indicated not only by the thermometer but by a sense of burning heat of the surface, which is communicated also to the hand of the observer. At the same time there is a severe intra-ocular, supra-orbital, and frontal pain, a boring or breaking pain in the sacrum and inferior lumbar region, gastric irritability, frequent vomiting of bile, great restlessness, and, in a goodly proportion of cases, delirium. These symptoms abate after about sixty hours, when, if a favorable result ensues, convalescence begins and the patient gets well in from six to ten days.

The above description constitutes the clinical history of a typical case, and this is modified more or less according to the greater or less severity of the case. Albumen is often if not generally present in the urine, but this is not regarded as of any diagnostic importance. Unless there should be "black vomit" it is never recognized as yellow-fever. It appears that this symptom is comparatively rare among the colored

race, at least at Port-au-Prince. Hence, from their standpoint, this last-mentioned disease is of infrequent occurrence. It is admitted, however, that "les blancs," when attacked, are liable to have "black vomit," *ergo*, yellow-fever. They do not place much stress upon jaundice as a diagnostic feature, doubtless because the inexpert observer overlooks it, as it is inappreciable in the black race except in the conjunctivæ.

The second difficulty which the inquirer has to encounter is an apparent effort on the part of professional men and laymen alike to conceal the truth. This is easily understood, and has its roots in the desire to protect the commerce of the port, upon which they are so largely dependent, and is not peculiar to Port-au-Prince. One meets with the same opposition in Rio and Havana from the same motive, and very likely it would be found in New York or Liverpool, provided that their trade should be threatened in a similar manner.

As a result of my investigations the conclusion forced upon me is that "Haytien" fever, especially in its severer forms, "mauvaise," "pernicieuse," is, in fact, yellow-fever, modified possibly by race and acclimatation.

Port-au-Prince is credited with being one of the most unhealthful cities in the world. To what extent this unsavory reputation is supported by facts I know not. There are no statistics to be obtained, and, as previously observed, investigators in this field meet with many discouragements. I fancy it would require personal observation, during a long residence, to arrive at any useful results. Assuming that its unhealthfulness is not exaggerated, the reasons for it are not hard to find. It has a population of about 35,000, of whom perhaps 1000 are whites. It is located at the bottom of a deep bay, which cuts into the western extremity of the island. The sewage flows, by surface drainage, into the inner harbor, where it stagnates from want of any current or tidal action to carry it away. (In this harbor the merchantmen anchor, and their crews often suffer greatly from fever.) The surface sewers consist of ditches cut on each side of the streets, half filled with slimy mud, through which the foul water slowly creeps, bearing to the sea its freight of filth of every description. A tropic sun beams upon this putrescent ooze, disengaging odors that are not those of "Araby the blessed."

SITKA.

SANITARY REPORT U. S. S. PINTA, BY H. B. FITTS, M.D., P. A.
SURGEON, U. S. NAVY.

Abstract from Report of Surgeon-General, U. S. Navy, 1890.

IN obedience to paragraph 8, page 14, of "Instructions for Medical Officers of the United States Navy," I have the honor to submit the following report relative to the sanitary condition of the U. S. S. Pinta and naval guard-house at Sitka, Alaska.

There were during the year 56 patients treated, with a total of 436 sick-days, being an average of 7.78 days for each patient. Concerning the causes, 14 were of venereal origin, with 149 sick-days; 22 climatic, with 112 sick-days; 16 due to injuries (all slight), with 133, and 3 due to alcoholismus, with 18 sick-days. Thirty-four cases originated in the line of duty, and 22 were not traceable to any act of duty.

Of the cases attributed to climatic causes, the majority is made up of catarrhus, bronchitis, tonsillitis, rheumatismus, and neuralgia, with three cases of adynamia. Besides these, numerous cases of catarrh, coughs, colds, and sore throats were treated without being admitted to the list. It is more than probable that many cases of venereal disease were never reported, owing to the system of restricting all such cases to the ship or barracks. This precaution seems right and proper, though to render it effective it would be necessary to subject the men to examination at least once a month.

There have been no deaths during the year and only 5 invalidated to hospital.

Mention was made in the last annual report of an epidemic or erysipelas which occurred among the Indians during the winter of 1888. Strange to say, the disease has not broken out again. This cannot be attributed to any increased cleanliness or improvement in sanitary arrangements, for the houses are still as much as ever filled with filth, the drainage as im-

perfect or completely lacking, the habits of the natives are as unwholesome, and not a blanket nor an article of the tainted clothing was ever destroyed or disinfected. Consequently a new outbreak of the epidemic may be looked for at any time.

The natives of Southeastern Alaska were formerly of fine physique and good constitution, but at present the whole race is so completely saturated with syphilis and scrofula, both inherited and acquired, while their ignorance of the laws of health is so dense that such diseases as consumption and rheumatism annually carry off or leave crippled hundreds whom a little care and medical attention might save. Doubtless the climate and their mode of earning a livelihood, which compels them to undergo a great many hardships, are conducive to such diseases.

It must be admitted, however, that were an unlimited supply of medicines at our disposal it would not avail much toward accomplishing the desired purpose. In order for any real and permanent good to be done it would be necessary for a small hospital and dispensary to be established at Sitka, with a physician in charge who should have authority to compel the Indians to bring their sick, especially the children, for relief, and a nurse or assistant to go among and teach them a few simple means of avoiding disease and caring for the sick. Occasional visits should also be made to other settlements for the same purpose. The sick from these places would then come of their own accord or could be brought to Sitka for treatment. As to who should assume the task of giving relief to these people, it is not within the province of this report to discuss. The duty certainly does not devolve upon the Medical Department of the Navy. But it is equally certain that as long as a naval vessel is stationed in Alaskan waters, and until substantial aid comes from some source, they will continue to look to the naval surgeons for help.

A few words as to climate and the principal diseases to which men and officers in these waters are subject. The climate is well known to be not only mild but equable, extremes of heat and cold being equally unknown. The proximity of the warm Japanese current so modifies the climate that 10° above zero, Fahrenheit, is ordinarily about the lowest winter temperature recorded at Sitka. Winter may be taken

as lasting from about October 1st to April 1st, during which the thermometer usually ranges from about 20° to 40° ; while summer may be counted from April to October, with a temperature of from 50° to 70° .

Notwithstanding the large amount of rainfall, which is the principal source of discomfort, the climate cannot be called a damp one, since the relative humidity of the atmosphere, as shown by the wet and dry bulb thermometers, is always low, the average being about 75 per cent.

It is observable, however, that those diseases usually supposed to be caused by cold and dampness, such as bronchitis, catarrhs, sore throats, neuralgia, rheumatism, and the like, are extremely frequent and persistent in this climate, occurring often in epidemics, especially during the prevalence of certain winds, as the easterly and southeasterly.

It should be mentioned that during the present winter a form of catarrh has prevailed of so severe a nature as to resemble "influenza" or "catarrhus epidemicus." Scarcely a person in Sitka has escaped, though no fatal cases have occurred, unless it can be said to have developed pre-existing affections which terminated in death. Pneumonia is rare, except catarrhal pneumonia among children, but pleurisy is not uncommon, while phthisis is extremely rife among the Russians and natives. No doubt the latter disease is hereditary among these people, and is also promoted by their habits of negligence and wilful violation of the natural laws of health. But from my own observation I am forced to the conclusion that the Alaska climate is not a favorable one for persons with weak lungs or a tendency to consumption, bronchitis, neuralgia, or throat troubles. Some isolated cases of these diseases and of rheumatism, coming from a distance, have done well here, while others, apparently in good health on arrival, have developed pulmonary disease after a residence of some months. No cases of scarlet-fever, measles, or small-pox have occurred for a number of years past, but I am informed that epidemics of these diseases do sometimes occur, and it is well known that small-pox has decimated the native population from time to time. No vaccination ever being done among them, they are liable to a revisit of this disaster at any time.

Reference has already been made to the recent epidemic of erysipelas and its disastrous results.

Owing to the law prohibiting the importation of alcoholic beverages into the country, the saloons are usually supplied with noxious fluids compounded of adulterated alcohol, cheap whiskey, etc., which, being frequently indulged in by the men, are frequent sources of gastritis and a debilitating form of alcoholism.

Alaska is not an agricultural country, though a few small gardens are cultivated, and in summer a meagre supply of green vegetables is obtainable. No cattle nor sheep and but very little pork is raised in the Territory, but venison, wild fowl, and many species of fish are plentiful, and of fine flavor. For variety we occasionally have beef and mutton shipped from Washington, but this can only be done in winter, while for fruits and vegetables we are compelled to rely almost entirely upon canned goods, which are obtained of very good quality from California. No cases of disease have been traceable to the use of canned goods, and the notable infrequency of diarrhoea and other digestive troubles may be partly attributed to the absence of fresh fruits. Monotony of diet, while often a source of complaint, cannot be said to favor sickness, though it causes greater difficulty in treating patients for whom special diet is necessary. Hence the necessity often for transferring to the hospital at Mare Island certain cases of adynamia and dyspepsia. Great difficulty is often experienced in replacing certain drugs which become exhausted before the regular semi-annual supply is received, since it requires from a month to six weeks to obtain anything from Portland, Ore., or Port Townsend, Wash., our nearest sources of supply. Hence the necessity for a larger allowance of those medicines which are required here in quantities for the treatment of the prevailing diseases mentioned above.

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

OBLIGATORY VACCINATION was the subject of discussion before the Academy of Medicine recently, on which *Le Progrès Médical* reports M. Colin as follows : " He could not subscribe to the opinion of M. Le Fort and prefer isolation of cases of small-pox, however useful that course might be, to the prophylactic effects of vaccine. He presented the statistics from the French army from 1863 to 1882—not including the war of 1870—in which there were 75 deaths yearly from variola. From 1883 the mortality fell to 15. In 1885 it was only 6, and in the last ten months of 1890 there were only 4 deaths ; so that during the eight years last past there were only 104 deaths, a number less than that of any of our large cities for one year. He does not fear any reaction in public opinion from the persistent opposition of the anti-vaccinators, especially since, by the use of animal virus, all fear of introducing syphilis has been removed. He thinks, however, that even without a war there is room to fear a reappearance, as if cyclic, of the epidemic of 1870 among the people who are not protected by vaccination."

Vaccination and revaccination, as reported by the *Gazette Hebdomadaire*, were vigorously defended by M. Pean before the Academy at a later session, and the adoption of the report of the Committee on Public Hygiene was strongly urged. Vaccination, he said, must be made obligatory, and it will be as readily accepted by the public as obligatory military service and obligatory attendance at school ; he thinks no one should have the liberty to infect his fellow-citizens, and he asks the Academy to adopt, without any change, all the articles proposed, which he has formulated as follows :

" The committee, considering that vaccination and revaccination are the only means of preventing the dissemination of small-pox ;

" That the slight operation necessary does not present any danger when properly done ;

" That it is without danger, not only in time of epidemics of small-pox, but that it is the only measure capable of arresting the epidemic ;

" That small-pox has almost entirely disappeared from those countries in which vaccination and revaccination are obligatory and properly performed ;

" That this disease ought to disappear completely from civilized countries ;

" Considering, finally, that we possess in animal vaccine a means of procuring a perfectly pure lymph, capable of affording absolute safety and sufficient for all contingencies,

" They recommend :

" That a law be passed making vaccination and revaccination obligatory in France.

" M. Dujardin-Beaumetz thinks that the enforced isolation of those having the disease would be much more difficult than vaccination and revaccination. He thinks that isolation and disinfection are very desirable, but that it will be very difficult to make them effectual."

Vaccination affords immunity from influenza. The *Revue Internationale de Bibliographie Médicale* of January, 24th ult., quotes the *Berl. Klin. Wochenschrift* of December 8th, 1890, as follows : " Last year, in the month of November, small-pox and influenza were causing great destruction of life in Madeira. M. J. Goldschmidt, who is practising on the island, remarked that vaccination, or rather revaccination, performed as a preventive against variola with animal virus, acted also as a prophylactic against influenza. Not one of 112 cases revaccinated successfully by the doctor took influenza, and of 98 other cases, in which the result of revaccination was negative, only 15 were attacked.

" The following fact is still more conclusive. Of 25 inhabitants of an isolated village, the 12 persons who were revaccinated, 9 successfully, all were exempt from the influenza, while the 13 who were not revaccinated were all attacked. It is well known that epidemic *grippe* rarely attacks children, especially those who are very young. This fact is explained, according to M. Goldschmidt, by the preventive action of the vaccine, whose protective influence had not had time to be exhausted in the system."

CHOREA OF THE LARYNX.—A very interesting case is given by a correspondent in the *Siglo Medico* of February 15th last.

A lady, V. J., twenty years of age, applied for treatment in July, 1890. Her previous history did not show any tendency to disease; she was not hysterical nor even predisposed to pulmonary troubles; there were no symptoms of tuberculosis nor of bronchitis.

Until July 19th of last year she enjoyed perfect health, but on that day she was attacked with the *grippe*, after which she had aphonia with dry cough, a peculiar and unnatural voice which continues during the day and disappears completely when she is asleep.

With the laryngoscope I discovered very strong contractions and sudden relaxations of the inferior vocal chords. Clonic, convulsive movements, which led me to diagnose the case as a choreal affection of the larynx, and I began to look for the cause of this condition of the vocal chords.

Rhinology has of late made rapid strides in advance, and for that reason the nasal fossæ were examined, and I found, to my great satisfaction, that the mucus which lined the cornets on both sides were very much hypertrophied and compressed the nasal septum.

Suspecting that the laryngeal trouble might proceed from a reflex disturbance of the mucus of the nose, I applied the following tests: I began by applying to the Schneiderian membrane a solution of the hydrochlorate of cocaine, which acts very favorably on the mucus of the nose, and found that while the effects of the agent lasted the clonic contractions of the larynx ceased as if by magic. On the contrary, the slightest excitation of the pituitary mucous membrane excited violent spasms of the vocal chords. I applied a small quantity of the caustic paste of Mackenzie to the hypertrophied membrane, and the effect on the larynx was such that the patient passed three days in great distress, all the symptoms of the larynx being greatly aggravated.

In view of these facts, the ideas of Hack were again confirmed; the cause, the prognosis, and the treatment which I was looking for were made perfectly plain.

I treated the hypertrophied condition with the galvano-cautery, and by its use succeeded in curing the laryngeal

affection which had caused so much suffering to the patient.

In conclusion, I may remark :

1. That the choreal affection of the larynx may be caused by reflex action of the mucus of the nose, and the laryngeal trouble must sometimes be considered a neuropathic condition of nasal origin.
2. That the treatment in such affections must be directed to the nasal affection.

THE RESULTS OF ANTISEPTIC TREATMENT OF THE INTESTINES in cutaneous affections resulting from the continued use of the bromides and of borax, was, according to *Le Progrès Médical*, the subject brought to the notice of the Biological Society by M. Fétré.

Naphtol, given internally, as M. Fétré had previously shown, has a most happy effect on the ulcers caused by the use of bromides, and besides this curative action it allows the prolonged use of the bromides without danger of inducing the cutaneous effects in such cases as are not suffering from the affections which follow these remedies.

Borax, used in the treatment of epilepsy, may sometimes cause psoriasis, as has been pointed out by Gowers and sometimes eczema, as M. Fétré has remarked.

Cutaneous diseases, which, like those resulting from the use of bromides, appear to be connected with gastric disturbance, are also relieved by naphtol.

OF PURGATIVE AND APERIENT WATERS *Villagabras* is probably the most efficient as well as the most acceptable to the taste and stomach of any now in use. It is a soda-sulphate water of unusual strength, yet almost tasteless and devoid of irritating properties to the digestive organs. According to an article in the *Therapeutic Gazette*, January, 1890, it is particularly recommended by Dujardin-Beaumetz in the treatment of constipation and its complications, its use not being followed by subsequent constipation—a condition common to other purgatives. It has but recently been introduced into this country, but it has already gained high favor with many physicians, and is rapidly overcoming the too extensive use of

numerous *bitter* and other disagreeable waters less efficacious in the treatment of affections amenable to the exclusive properties of *Villagabra*.

ELECTRICITY PRODUCED BY RESPIRATION.—The discovery of the production of electricity by the act of respiration is credited by the *Revista Internazionale d'Igiene* to the experiments of Dr. Hamburger. It has already been observed that the heart at every systole, besides the phenomena of motion and the generation of chaloric, also gives rise to the production of electricity, as may be demonstrated experimentally with Marcy's capillary electro-motor, by placing one electrode impolarizable at the apex of the heart and the other at its base.

Hamburger, by employing the same method, has demonstrated that although the respiratory movements generate electricity by the friction of the lungs on the heart, these organs might assume a different electrical condition in which the lungs are shown to be capable of generating, in the capillary electro-motor oscillations equal to three one thousandth of Daniel's scale. This fact is independent of every phenomena, nervous or circulatory, because, if it can be produced, even on the cadaver, with the heart at rest and in its natural position, by means of artificial respiration, yet, on the other hand, it will be absent when the heart is removed from contact with the lungs.

PHENACETINE IN TREATMENT OF TUBERCULOSIS, AFTER KOCH'S METHOD.—In article entitled "Practical Observations on the Treatment of Tuberculosis after Koch" (*Berl. Klin. Wochschr.*, 1890, No. 47), Dr. Dengel says: "Of the direct effects caused by the injections, I shall mention here only the feeling of coldness and the chills, which could be sufficiently overcome in all cases by warming-bottles, warm bedding, and hot drinks. In some cases phenacetine acted as a prophylactic in cutting short to a certain degree the rise of temperature."

PHYSIOLOGICAL ACTION OF ARISTOL. (*Société de Biologie*, Séance du 28 Juin, 1890).—Juinqaud and Fournioux injected an oleous solution of aristol under the skin of animals. Dogs

could stand doses equal to 2.5 gms. to 1 kilo. (20 grains to 1 lb.) of body weight without showing any toxic symptoms. The excretion of the drug goes on very gradually; iodine is found in traces in the urine for four or five days after the injection. In conclusion the authors state that aristol is of great value in the treatment of all kinds of ulcerations, more especially in chronic ulcers of the leg, soft and hard chancres, and in lupus and epithelioma.

PHENACETINE-BAYER IN THE TREATMENT OF INSOMNIA.

—In a communication to a recent number of the *Medical Record*, Dr. F. Peyre Porcher calls special attention to the extreme value of phenacetine as a remedy for insomnia. Given at night in a little water it is tasteless, innocuous, and induces sleep. I am confident, also, after repeated trials, that it is the best and most unobjectionable substitute for morphia. It causes sleep when, of course, pain is in abeyance, unless the pain be more than ordinary, and morphia hypodermically may then be required. The remedy may be repeated and the dose increased to seven or ten grains.

Suffering from chronic rheumatism of the forearm, I have tested it repeatedly in my own person, and have given it to many who have suffered from insomnia, or inability to sleep from any transient cause, fatigue, nervousness, excitement, etc., in either sex.

DISINFECTING ADVANTAGES OF THE PEROXIDE OF HYDROGEN (H_2O_2).

THE special merit of this disinfectant, as given by Dr. Altehofer, of Rostock, in the *Cent. f. Bakteriologie und Parasitenkunde*, is, besides its efficiency, that it does not alter the appearance, taste, or smell of water to which it has been added.

The first experiments were made with spring water, the second with hydrant water, and a third with river water. The first contained 560, the second 180, and the third 1800 germs in each cubic centimetre. To these several waters were added H_2O_2 , in the proportion of 1.5000 and 1.10000, and after an exposure of twenty-four hours inoculations of gelatin and

agar-agar were made. In each case abundant colonies developed, but those from the weaker solution were in greater number and more vigorous.

A second series was made upon hydrant water to which sewage had been added in the proportion of two per cent and one half per cent. The solutions were not sterilized even when H_2O_2 was added in the proportion of 1.2500.

Observations were made upon solutions containing H_2O_2 in the proportion of 1.1000. Three samples of potable water were used containing respectively, as was ascertained by cultivation, 160, 600, and 6000 germs per cubic centimetre. The results in these three cases were, at the end of the seventh day, for the first sample three colonies, the second two, and the third ten. While this shows that the peroxide, in the proportion of 1.1000, is not sufficiently powerful to destroy all the ordinary germs of drinking water, it will destroy the greater number. Solutions of this strength impart a slight metallic taste to water, but this disappears shortly after it has been added. To 100 cubic centimetres of sterilized water one half ccm. of sewage was added and one ccm. of H_2O_2 . This mixture was found to be absolutely sterile at the end of twenty-four hours.

Experiments made with the typhoid and cholera bacillus showed that they were completely destroyed when H_2O_2 was present in the proportion of 1.1000.

The author recommends the disinfection of drinking water by this means in times of epidemics, not only from its efficiency and cheapness, but also because the potability of the water is not altered.

Dr. Charles P. Noble, of Philadelphia, in a recent communication to the *Medical and Surgical Reporter*, particularly commends the peroxide as a cleansing agent to the hands in surgical practice. He says :

"The method which I employ for rendering the hands aseptic is as follows : The nails are trimmed reasonably short, and the subungual spaces are cleared with the knife blade. The hands and forearms are then thoroughly washed in warm water, a good lather being made with soap, and a stiff nail brush being vigorously applied. The water is renewed three times. The hands are next soaked in a saturated solution of

permanganate of potassium, and this removed by soaking them in a saturated solution of oxalic acid. According to circumstances, the finger tips are next soaked in peroxide of hydrogen ; for the final bath corrosive sublimate solution $\frac{1}{100}$ is employed. The hands remain in the sublimate solution three minutes. At least ten, and often fifteen minutes are consumed in the cleansing process.

" For some months, in preparing for abdominal sections, I have used the peroxide of hydrogen solution in full strength to assist in cleaning my hands, especially about the finger tips and nails, whenever, for any reason, I have felt doubtful about their aseptic condition. The peroxide has been used whenever the skin about the nails has not been in good condition ; and it is remarkable to see how it will soften horny skin at the side of the nail, and disintegrate *débris* in the subungual space, or macerate and even remove epidermic scales. There can be no doubt that foreign material can be removed from the fingers much more completely by using the peroxide solution after using soap and water and the nail brush, than by the use of these agents alone. This certainly does *promote asepsis*. But whether the hands are made aseptic by the peroxide solution I have not been able to determine. Careful bacteriological experiments to determine this question will be of great practical interest and value.

" To those who are accustomed to wash the hands quickly, use the nail brush lightly, and to *dip* the hands in the sublimate solution, such elaborate and painstaking care doubtless appears like a useless expenditure of energy. But bacteriological experiments have shown that germs exist about the nails of fingers cleaned in this careful manner (omitting the peroxide solution) and have demonstrated the necessity for some more reliable method of rendering the hands aseptic, if the antiseptic conscience is to be satisfied. It is with the hope that the peroxide of hydrogen solution will meet this demand that I have brought the matter forward.

" Aside from using the peroxide solution in preparing the hands for abdominal operations, I have found it perfectly reliable in removing foul odors and stains from the hands, by contact with decomposing pus, discharges from cancer, and other septic fluids. I believe it will be equally useful to the general surgeon and obstetrician."

EDITOR'S TABLE.

✉ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

THE TRUTH ABOUT VACCINATION.

To A. N. Bell, A.M., M.D., Editor THE SANITARIAN :

DEAR DOCTOR: The article on "The Protective Power of Vaccination," by T. P. Corbally, A.M., M.D., which appeared in THE SANITARIAN for November, 1890, begins, like nearly all articles on the subject, by assuming that small-pox is a universal disease, and that the majority of mankind must necessarily suffer from it, unless protected by vaccination. It has been upon this assumption that the claims in favor of vaccination have been built up, and therefore any discussion on the subject must begin at this point.

The Chinese and other Asiatic peoples have for untold centuries believed that every child was born with small-pox stored away in the marrow of the bones. They believed it necessary to dislodge the disease by inoculating with small-pox virus, which they did, as Dr. Corbally states, by introducing the powdered crusts of the vesicles into the nostrils, thus actually producing the disease which they aimed to prevent. It is no wonder, then, that so many persons in China should be disfigured by small-pox.

In passing, a statement of Morache, which Dr. Corbally quotes, needs to be corrected. He says, "It is certain that nearly all the blind—and the number seems extraordinary—have lost their sight from small-pox." The truth is that the prevalence of blindness in China is due to the custom of daily turning the lids and washing and drying their mucous surfaces. This causes inflammation, granulated lids, ulceration, and opacity of the cornea.

The belief in the universality of small-pox, like other popular superstitions, spread from the East into Europe, and it only requires a rational investigation to prove its fallacy.

There is a great diversity of opinion among medical writers regarding the antiquity of small-pox. Whatever may be said of its remote history, all authorities agree that it was widely disseminated by the wars and expeditions of the Arabs, and entered Europe at the time of the overthrow of the Gothic monarchy in Spain by the Moors, about the beginning of the eighth century. It was not till the sixteenth century, however, that it rose to prominence in Western Europe, and it was little known in England till the seventeenth century.

In the early part of the eighteenth century the disease had materially decreased, but the latter half of the century again marked a great extension of its ravages. This increase was soon explained by the fact that inoculation, which was introduced into England by Lady Mary Wortley Montagu in 1750, had been extensively resorted to in Europe. This practice produced the disease and thus created new centres of contagion, from which it spread, instead of controlling its ravages, as was claimed by its zealous advocates. Simultaneously with the promulgation of the dogma of vaccination, the practice of inoculation was discontinued, and thus the ravages of small-pox had greatly diminished long before vaccination was practised to any extent.

The stories told about the fearful mortality from small-pox prior to the introduction of vaccination are entirely without foundation in fact, for in pre-vaccination times the death-rate was 18.8 per cent, while the percentage of deaths since 1870, with 95 per cent of the entire population vaccinated, is 18.5 per cent.* In short, every careful observer who has taken the trouble to examine this question must admit that mankind is no more prone to contract small-pox than any other disease to which we are liable. Dr. Creighton says, in the *Encyclopædia Britannica*, ninth edition, article Vaccination :

"It is a mistake to suppose that small pox has shown a tendency toward a universal affection ; for all its chances it has kept within moderate limits of age and place, and extended only by repeated provocation. Thus, Hirsch says of the Western Hemisphere : 'A still more terrible source for America was the importation of negro slaves, so much so

* See *Encyclopædia Britannica*, ninth edition, article Vaccination.

that in after years, particularly in South America and the West Indies, not only the first appearance of small-pox, but every fresh outbreak of it could be traced to importation from Africa—the African continent being then, as now and always, one of its principal native seats. In Europe it has been peculiarly a disease of infancy, and of the most crowded parts of cities. It has had victims among the upper classes, just as cholera has had ; but, like that disease, its habitat is among the crowded poor ; and it would have touched the well-to-do classes less in former times if there had always been spacious West End quarters in cities, or the modern passion for clean linen, personal ablutions, and fresh air. Tenement-houses and ill-ventilated courts or alleys have been the natural harborage of small-pox ; in proportion as these have been demolished the disease has disappeared or been circumscribed in its area. It is fallacious to estimate its ratio now in ratio of the whole population ; for a just comparison of one period with another we have to take into account not the death-rate per million living, but the death-rate per million still living under the Old World conditions. From the earliest period of its history in Europe, the disease has had its seasons of quickening or revival, with long intervals of quiescence ; only in the most crowded parts of Western cities has it ever been endemic from year to year. These epidemic outbursts have varied much in intensity and in area, the conditions of variation being mostly unknown. In that respect it need hardly be said that small-pox is like other epidemic diseases."

But, we are told, statistics prove the prevalence of small-pox before Jenner's time, and its great diminution since the practice of vaccination was generally introduced. Let us examine some of the statistics derived from official sources, and compiled by those who practise and believe in vaccination.

In Sweden, from 1779 to 1792, without vaccination and during a time when inoculation was practised, the deaths from small-pox per million inhabitants ranged from 300 to 900 per year. From 1802 to 1810, with from two to forty persons in every thousand vaccinated, the deaths per million inhabitants per year were, successively, 600, 600, 600, 450, 850, 750, 1000, 300. The following table shows the ratio of the subsequent years :

Year.	Vaccinated per 1,000 Inhabitants.	Deaths per Million Inhabitants.
1825.....	250.....	400
1839.....	590.....	575
1851.....	735.....	700
1874.....	970.....	960

In 1864 a report was published in England, in which tables were compiled to prove the value of vaccination. It commenced in 1838 and ended in 1861, and is summarized as follows :

For the years 1838, 1839, and 1840, before the compulsory vaccination act was passed, the average annual death-rate was claimed to be 11,944. From 1841 to 1853 vaccination was provided gratuitously but was not obligatory, and the average annual death-rate was 5221, but this does not include the years from 1843 to 1846; from 1854 to 1861, inclusive, vaccination was obligatory, and the average annual death-rate was found to have fallen to 3240. Here the report stopped, and it was claimed that vaccination had reduced the annual death-rate from 11,944 to 3240. In the last year included in the table the number of deaths was 1320; but in 1862 there were 1579 deaths, in 1863, 5891, in 1864, 7624, and these figures were available at the time the report was made. A more careful inquiry reveals the fact that the first period given in the above-mentioned table were the three years of a widespread epidemic, while the next epidemic period (1843 to 1846 inclusive) was omitted from the table. But, leaving these facts out of the question, is it not fair to ask : If vaccination reduced the annual death-rate, as stated, what increased the number of deaths in 1862, 1863, and 1864? By following the reports still further we find that in 1871 there were 23,062 deaths from small-pox, and in 1872, 19,022. This was the greatest mortality in a century, in spite of the fact that vaccination had been practised for 73 years, and was compulsory for 18 years.

A clearer view of the facts may be had by a study of the following tables :

Vaccination was made compulsory by act of Parliament in the year 1853; again in 1867, and still more stringent in 1871. Since 1853 we have had three epidemics of small-pox, each being more severe than the one preceding.

Date.	Death from Small-pox.
1st. 1857-58-59.....	14,244
2d. 1863-64-65.....	20,059
3d. 1870-71-72	44,840

Increase of population from 1st to 2d epidemic....7 per cent.
 Increase of small-pox in the same period, nearly..50 per cent.
 Increase of population from 2d to 3d epidemic....10 per cent.
 Increase of small-pox in the same period.....120 per cent.
 Deaths from small-pox in the first 10 years

after the enforcement of vaccination, 1854 to 1863...33,515
 In the second 10 years, 1864 to 1873.....70,458

The Registrar-General, in his Annual Summary for the year 1880, tabulates the small-pox mortality of London for the last 40 years as follows :

Decades.	Estimated Mean Population.	Small-pox Deaths.
1841-50.....	2,103,487.....	8,416
1851-60.....	2,270,489.....	7,150
1861-70.....	3,018,193.....	8,347
1871-80.....	3,466,486.....	15,543

In addition to these facts, the same returns show that for the year ending December 31st, 1881, 2371 persons died in London of small-pox.

Again, a careful examination of all returns of small-pox shows that the highest mortality in any one year, in London, in the last century, was 3992 ; while the total deaths from this disease during the first 20 years of the present century was 20,462, or an annual average of 1023, when neither inoculation or vaccination was practised to any extent. From the passage of the Registration Act in 1838, to 1853, when the Compulsory Vaccination Act was passed, the official returns of the Registrar-General show the total number of small-pox deaths to be 16,521, which makes an annual average of 1032. For the 24 years of compulsory vaccination ending with 1877, the annual average death-rate was 1092. Again, for the decade ending with 1880, and with 93 per cent of the population protected (?) by vaccination, the average annual death-rate increased to 1554 ; while during the year 1881 it was further increased to 2367.*

* These statistics can be verified by reference to the "Forty-sixth Annual Report of the Registrar-General of England." Abstracts of 1883. Also see Encyclopædia Britannica, article Vaccination.

Having already exceeded my allotted space, I must stop before fairly entering on the subject. My next communication will contain other statistics and analyze the methods by which the pro-vaccinators have made out their case in favor of vaccination.

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DR. BELL'S REPLY.

THE only statements in the foregoing which seem to challenge refutation are : (1) That "the stories told about the fearful mortality from small-pox prior to the introduction of vaccination are entirely without foundation in fact, for in pre-vaccination times the death-rate was 18.8 per cent, while the percentage of deaths since 1870, with 95 per cent of the entire population vaccinated, is 18.5 per cent," etc.

The incredibility of the authority cited in defence of this statement is shown by the unverifiable assertions in the quotation which follows, and the garbled statistics adduced to support it.

From definite statistics in the aggregate, collected from a great variety of sources, as published in the Transactions of the Epidemiological Society of London, in the Local Government and other reports, by the late Dr. William Farr, Registrar-General of England, one of the most renowned and universally accepted statistical authorities of the present century; and the Army and Navy statistics, scrupulously exact, of all civilized nations :

In England alone, for nearly a century before the introduction of vaccination, no fewer than 30,000 persons were annually cut off by small-pox, which in the same ratio, according to present population, would be equivalent to more than 100,000 deaths annually from the same cause. Out of every 1000 deaths from 1750 to 1800 there were, by small-pox, 96 ; from 1800 to 1850 there were, for the same number, but 35.

In Germany for the same periods of time there were, out of every 1000 deaths from all causes for the same period, by small-pox, 66.5 ; for the latter period, 7.26.

In Sweden, for the last 28 years before the introduction of vaccination, out of each million of the population there were

2050 deaths annually from small-pox ; for 40 years subsequent to the introduction of vaccination the number of deaths annually by small-pox per million of inhabitants was 158. The annual small-pox death-rate in that country during the period of 1841 to 1850 averaged less than the weekly death-rate from small-pox and measles combined during the period of 1755 to 1775. The deaths caused by small-pox annually before the introduction of vaccination was 205 in every 100,000 inhabitants ; since, the average has been only 15 per 100,000 ; and in recent years it has been still less.

In Westphalia, from 1776 to 1780 the small-pox death-rate per million of inhabitants was 2643 ; from 1816 to 1850 it was 114.

In Copenhagen, from 1751 to 1800, the rate per million was 3128 ; from 1800 to 1850 it was 286. In Berlin for the same period the rates relatively were 3444 and 176. And—

(2) Since 1850, in reply particularly to that portion of the foregoing beginning with an abstract of reports subsequent to the Parliamentary Act of England in 1853, the *truth* is that, notwithstanding the imperfect enforcement of the compulsory laws, the ratio of deaths by small-pox per thousand from all causes has been reduced from 35 to less than 12. And of other countries, according to the most recent reports from official sources, illustrating the benefit of compulsory vaccination compared with voluntary, the number of deaths from small-pox per million of inhabitants in each country named, for the period stated, has been as follows :

	1887.	1888.
Austria-Hungary.....	583.7	540.4
Russia.....	535.9	231.5
France	167.0	191.9
German Empire.....	1.8	0.8
Denmark.....	0.0	0.0
Sweden and Norway	0.0	0.0

Under the searching investigation of the English Royal Commission (not yet complete),* according to the evidence of Dr. William Ogle, Superintendent of Statistics in the office of the Registrar-General, the reduction of small-pox mortality has gone on in England hand in hand with the perfection of

* First Report of the Royal Commission appointed to inquire into the subject of vaccination, with minutes of evidence and Appendices, 1889.

the system of vaccination carried out. The mean annual death-rate *per million* from small-pox during the period of 1847-53, when vaccination was optional, was 305; it was reduced to 223 during 1854-71, when vaccination, though obligatory, was not enforced, and was further reduced to 114 for the period 1872-87, when compulsory vaccination became more systematically enforced. From 1868 to 1889, including the great epidemic of 1872, which has been the subject of much fallacious capital by anti-vaccinationists, because that was the first year (in consequence of the prevalence of small-pox) when compulsory vaccination began to be generally enforced, the ratio of deaths from small-pox per million deaths from all causes was 155.

That vaccination *alone* is to be credited with the decline in the death-rate from small-pox is made manifest by its relation to the early periods of life. After fifteen years of age there has commonly been an increase in the ratio, proportional with the lapse of time since vaccination in infancy. The table in which Dr. Ogle demonstrates this is so conclusive that we here reproduce it. It shows conclusively that the saving of life from small-pox which has been effected has been by vaccination alone, and not by improved sanitation generally, as contended by the anti-vaccinationists and a few others who agree with them in that particular.

MEAN ANNUAL DEATHS FROM SMALL-POX, AT SUCCESSIVE LIFE-PERIODS, PER MILLION LIVING AT EACH SUCH LIFE-PERIOD, IN ENGLAND, 1847-53, 1854-71, AND 1872-87.

PERIOD.	All Ages.	0-5.	5-10.	10-15.	12-25.	25-46.	45 and upward.
(1) Vaccination optional, 1847-53.*	305	1,617	337	94	109	66	22
(2) Vaccination obligatory, but not efficiently enforced, 1854-71.	223	817	243	88	163	131	52
(3) Vaccination obligatory, but more efficiently enforced by vaccination officers, 1872-87.	114	242	120	69	122	107	47

* In this table the period of optional vaccination begins with 1847, not with 1838, because the deaths were not abstracted in combination with ages until 1847.

STATE MEDICINE—AMERICAN MEDICAL ASSOCIATION.—Dr. BENJAMIN LEE, Secretary of the State Board of Health of Pennsylvania, has accepted the position of Secretary of the Section on State Medicine of the American Medical Association, to meet at Washington, May 5th. It is important that all papers intended for this Section should be in his hands by April 5th. All members of the Association desiring to be enrolled in the Section are requested to forward him their names at 1532 Pine Street, Philadelphia.

TO STUDY DR. KOCH'S METHODS WITH RELATION TO YELLOW-FEVER.—According to advices from Rio Janeiro, Dr. Domingos Freire, the Brazilian yellow-fever expert, has been sent by his Government to Berlin to study the Koch methods.

The Brazilian Government has recently founded an institute for the preparation of the attenuated culture of yellow-fever germs, by inoculation, with which almost absolute immunity is given from yellow-fever. The Government has authorized the expenditure of \$5000 for bacteriological apparatus.

HYGIENIC LABORATORY.—Henry C. Lea, of Philadelphia, has given the University of Pennsylvania \$50,000 for the erection of a hygienic laboratory. The plans have been revised by John S. Billings, and as he obtained some ideas during a visit to Europe, and has embodied them in the plans, the building will be the finest hygienic structure in the world. Lecture-rooms, museums, bacteriological and photographic-rooms, a crematory, separate building for animals, etc., are to be provided.

MICRO-ORGANISMS IN CITIES.—Professor Tarnier, in his course of lectures on obstetrics, in 1890, referred to M. Miquel's researches on the relative abundance of micro-organisms in different places. One to the cubic metre of air is the proportion at the top of a high mountain. In the Parc de Montsouris in the south of Paris, M. Miquel found 480 micro-organisms to the cubic metre of air, while in the Rue de Rivoli the proportion was 3480. In a new room in the Rue Censier he found 4500 to the cubic metre; more, that is to say, than in the centre of Paris in the open air. In a room in the Rue

Monge he counted 36,000, in the Hotel Dieu 40,000, and in the Pitié, an older hospital, 319,000 micro-organisms to the cubic metre. At the Observatory Montsouris, 650,000 microbes were found in a gram (15 grains) of dust ; in the room in the Rue Monge the amount was 2,100,000. In the hospitals the proportion was so high that counting the number of microbes in a whole gram of dust was found to be impossible. The dust is the great conveyer of micro-organisms. At 2 A.M., when a city is most quiet, the fewest germs are to be found in the air ; at 8 A.M. the industry of domestic servants and dust-men has already made the air to teem with germs. At 2 P.M. the proportion has again greatly fallen ; at 7 P.M. it is once more high, for many houses are being "tidied up;" besides sundry kitchen operations are unhygienic. Thus the "small hours," unfavorable in many respects to patients hovering between life and death, are the least septic of the twenty-four. The day proportions indicate that household duties cause more septic diffusion than is excited by traffic and industry.—*British Medical Journal.*

A SANITARY EMBLEM.—If our women readers could only understand, says the New York *Press*, what a convenience, economy and thorough cleanser Pyle's Pearline is, they would never use anything else. It is pure and free from any injurious ingredient. It is economical because only the requisite quantity is used at a time. While soap may slip from the fingers and be lost in the water to dissolve, Pearline is used only in quantities required. It is better adapted for cleansing around the house than any known article. It is more convenient than anything ever discovered, and it is as suitable for the most delicate lace or the finest linen as for the dirtiest horse-blanket, and it will make either as "clean as a whistle" in short order. All grocers sell it, and if the reader don't know of it she may take our word for it.

THE MATTISON PRIZE.—With the object of advancing scientific study and settling a now mooted question, Dr. J. B. MATTISON, of Brooklyn, offers a prize of \$400 for the best paper on "Opium Addiction as Related to Renal Disease," based upon these queries :

Will the habitual use of opium, in any form, produce organic renal disease?

If so, what lesion is most likely?

What is the rationale?

The contest is to be open for two years from December 1st, 1890, to either sex, and any school or language.

The prize paper is to belong to the American Association for the Cure of Inebriety, and be published in a New York medical journal, *Brooklyn Medical Journal* and *Journal of Inebriety*.

Other papers presented are to be published in some leading medical journal, as their authors may select.

All papers are to be in possession of the Chairman of Award Committee on or before January 1st, 1893.

The Committee of Award will consist of Dr. Alfred L. Loomis, President New York Academy of Medicine, Chairman; Drs. H. F. Formad, Philadelphia; Ezra H. Wilson, Brooklyn; George F. Shrady, and Joseph H. Raymond, Editor *Brooklyn Medical Journal*.

THE AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION was organized on January 22d, 1891, at the Academy of Medicine, No. 17 West Forty-third Street, New York, by the adoption of a Constitution and By-Laws and the election of officers. The object of the Association, as stated in the Constitution, is: "The cultivation and promotion of knowledge in whatever relates to the application of electricity in medicine and surgery."

The Association starts with a strong and vigorous membership, and has every prospect of a most useful and successful career.

The next meeting will be held in Philadelphia in September of this year.

WILLIAM H. WALLING, M.D., *Secretary,*
2005 Arch Street, Philadelphia, Pa.

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

CORRESPONDENTS under this head are particularly requested to be prompt.

ALABAMA.—*Mobile*, 40,000 : Reports 95 deaths during January, of which 19 were under five years of age. Annual death-rate, 28.5 per 1000. From zymotic diseases, 6, and from consumption, 14.

CALIFORNIA.—Mortality reports received for January from ninety-four localities in different parts of the State, with an estimated population of 736,100, give the number of deaths as 1213, representing an annual death-rate of 19.68 per 1000.

The principal zymotic diseases caused 163 deaths, consumption 193, pneumonia 138, and bronchitis 47.

San Francisco, 300,000 : Total deaths, 612. Annual death-rate, 24.4 per 1000.

Sacramento, 30,000 : Total deaths, 36. Annual death-rate, 14.4 per 1000.

Oakland, 60,000 : Total deaths, 72. Annual death-rate, 14.4 per 1000.

Los Angeles, 60,000. Total deaths, 85. Annual death-rate, 17.00.

CONNECTICUT.—For the month of January the Secretary of the State Board of Health reports 989 deaths in 166 cities and towns aggregating 741,766 inhabitants, showing the temporary annual death-rate for the State to be 14.8 per 1000. The mortality from zymotic diseases was 117, being 11.8 per cent of the total. From consumption there were 111 deaths.

New Haven, 85,830 : Total deaths, 117—27 under five years of age. Annual death-rate, 15.0 per 1000.

Hartford, 53,000 : Total deaths, 86—24 under five years of age. Annual death-rate, 15.6 per 1000.

Bridgeport, 48,740 : Total deaths, 63—23 under five years of age. Annual death-rate, 14.9 per 1000.

Waterbury, 33,180 : Total deaths, 45—10 under five years of age. Annual death-rate, 16.2 per 1000.

DISTRICT OF COLUMBIA, 250,000 : Total deaths in five weeks ending January 31st, 473—143 under five years of age, and 228 in the colored population. Annual death-rate, 20.0 per 1000. From zymotic diseases there were 77 deaths, and from consumption, 60.

FLORIDA.—*Pensacola*, 15,000 : Three weeks ending January 31st. Total deaths, 13. Annual death-rate, 15.08 per 1000.

ILLINOIS.—The Governor, in his message to the Legislature, January 8th, 1891, says of the *State Board of Health*: "It has proved an efficient agency in the preservation of the public health. The able and prudent manner in which the affairs have been conducted during the past two years entitle it to the renewed confidence of the people and the continued support of the General Assembly. In recent years much time has been devoted by the board to an examination of the water-supply of the State and the pollution of its streams. A thorough study of the Illinois River basin has been made with a view to sanitary engineering, and the pollution of that stream by Chicago sewage has been the subject of continued investigation and consideration.

With the exception of the influenza, to a study of which disease the board devoted much time and thought, the health of the State has been unusually good. Diphtheria, scarlet-fever, and typhoid-fever have prevailed at times in certain localities in the State, but were generally brought under control when the instructions of the board were obeyed. In many cases the advice of the board was wholly disregarded, and as a result, a spread of the disease usually followed. The law should be amended so as to make it obligatory upon the local authorities to report promptly all diseases of this character to the Board of Health. A law of this kind would enable the board to act promptly and efficiently in checking the spread of contagious diseases.

In addition to its other duties, the board has given considerable of its time and attention to the work of elevating the standard of the medical profession in the State, and as a result the interests of the afflicted have been conserved by driving from active practice many who were not qualified to belong to this highly useful and honorable profession.

• Seventh Report on Medical Education, Medical Colleges, and the Regulation of the Practice of Medicine in the United States and Canada, 1765-1891. Medical Education and the Regulation of the Practice in Foreign Countries. By John H. Rauch, M.D., Secretary, 1891.

For the first time in its history the Report on Medical Education, issued by the Illinois State Board of Health, embraces the medical institutions of the whole world. This is a feature that will be an assistance to medical boards that have to determine the value and validity of a medical diploma.

As regards medical education in the United States, most of the changes for the better that have been made in this century have occurred since 1881, when the first number of this Report was published, and since 1882-83, when the schedule of minimum requirements of the Illinois State Board of Health went into effect.

Special attention is called to the fact that in some of the largest universities in this country courses preliminary to the study of medicine are now offered—the University of Pennsylvania, Cornell, Yale, Princeton, Lake Forest and Northwestern Universities, Johns Hopkins, and the University of Wisconsin, while Harvard has made arrangements by which those intending to study medicine can take a special A.B. course in three years. The Report shows a marked increase in requirements as to preliminary education during the year 1890. It shows also that the movement for four years' study and three courses of lectures is an assured success, and a list is given of the colleges that have adopted or will soon adopt the requirements of longer terms of study.

It is suggested that, with four years' study and three courses of lectures assured, the boards of medical examiners and the colleges should co-operate in establishing a system of registration of medical students before they enter college, in order that the requirement of one year of study outside a college may not be mere form.

A résumé of the medical practice acts in the different States and Territories is a valuable addition to the Report.

That portion of the Report devoted to institutions and regulations in foreign countries contains in full the requirements of the examining boards in Great Britain, with the names of all the medical schools and of all the hospitals in which instruction is given. The requirements as to preliminary education in foreign countries are given for purposes of comparison, as well as the requirements for graduation and for the license to practise. The course of study and the semesters in which the various subjects should be taken up, as advised in the German universities, as well as a description of the German method of examining for the license to practise, are given in full. In addition, the correct names and locations of foreign medical institutions are given.

Chicago, 1,200,000 : During the month of December there were 1990 deaths—930 under five years of age, representing an annual death-rate of 16.58 per 1000. From zymotic diseases there were 362 deaths, and from consumption, 159.

IOWA.—*Council Bluffs*, 28,000 : Total deaths during December, 25. Annual death-rate, 1.10 per 1000.

Davenport, 33,715 : Total deaths during December, 35. Annual death-rate, 21.6 per 1000.

Des Moines, 53,000 : Total death during December, 62. Annual death-rate, 14.4 per 1000.

Sioux City, 37,862 : Total deaths during December, 40. Annual death-rate, 16.8 per 1000.

LOUISIANA.—*New Orleans*, 254,000 : During the five weeks ending January 31st there were 824 deaths—145 under five years of age and 266 in the colored population. Annual death-rate, 33.85 per 1000. From zymotic diseases there were 126 deaths, and from consumption, 109.

MARYLAND.—*Baltimore*, 455,427 : The total number of deaths reported during the year 1890 was 10,198, of which 4117 were of children under five years of age.

The death-rate for the year is 22.41 per 1000 of population, the white death-rate being 20.98, and the colored 30.15. This

is an apparent increase of 5.01 per 1000 over the mortality of last year. But inasmuch as the estimated population on which the calculation of the mortality rate was based was nearly 50,000 too high, the increase in the death-rate is only partly an actual increase. If the same estimated population were used as last year, the difference in the death-rate between the two years 1889 and 1890 would be only 2.03 per thousand.

From zymotic diseases there were 2181 deaths—21.19 per cent of total, and from consumption, 1249—12.25 per cent of total.

For the month of January, 1891, the total deaths were 780, as against 930 for the corresponding month of 1890. Of these, 601 were white and 179 colored, a death-rate of 18.72 per 1000 for the former and 30.25 for the latter. Eighty-six died from zymotic diseases, 104 from consumption, and 112 from pneumonia. Two hundred and forty-eight, or 32 per cent of the total deaths, were in children under five years of age.

Infectious diseases reported during the month, 186 cases, a decrease of 44 from December, 1890. The greatest decrease occurred in diphtheria, croup, and scarlet-fever, and there was a decided increase in measles. Diphtheria, croup and scarlet-fever fell from 104, 22 and 73 cases, respectively, in December to 59, 14 and 55 in January. Measles increased from 4 cases in December to 33 in January, and whooping-cough from 23 to 24.

MASSACHUSETTS.—*Boston*, 448,477 : There were reported during the year 1890 10,181 deaths, of which number 3349 were of children under five years of age.

The death-rate per 1000 inhabitants was 22.70. In 1889 it was 24.42.

Zymotic diseases caused 1677 deaths—291 less than in 1889, and consumption caused 1495—64 more than in 1889.

MICHIGAN.—The Secretary of the State Board of Health reports for the month of January, 1891 : Compared with the preceding month, the reports indicate that cholera infantum, whooping-cough, dysentery, cerebro-spinal meningitis, and typho-malarial-fever decreased in prevalence. Compared with

the average for the month in the five years 1886-90, cholera-morbus, membranous croup, influenza, and puerperal-fever were more prevalent, and whooping-cough, cholera-infantum, typho-malarial-fever, diphtheria, measles, and typhoid-fever were less prevalent in January, 1891.

Reports from all sources show diphtheria reported at eight places more, scarlet-fever at one place more, typhoid-fever at same number of places, and measles at thirty-seven places more in the month of January, 1891, than in the preceding month.

Detroit, 220,000 : Reports for January 326 deaths—68 under five years of age. Annual death-rate, 17.44 per 1000. From zymotic diseases there were 64 deaths, and from consumption, 32.

MINNESOTA.—*St. Paul, 150,000* : Reports for January 122 deaths, of which 59 were under five years of age. There were 33 deaths from zymotic diseases, and 9 from consumption. Annual death-rate, 9.76 per 1000.

MISSOURI.—*St. Louis, 460,000* : Reports during January 725 deaths, of which 239 were under five years of age. Annual death-rate, 18.91 per 1000. From zymotic diseases there were 101 deaths, and from consumption, 73.

NEW JERSEY.—*Paterson, 78,350* : Reports for the month of January 160 deaths, of which 58 were under five years of age. Annual death-rate, 23.28 per 1000. From zymotic diseases there were 24 deaths, and from consumption, 25.

NEW YORK.—The Secretary of the State Board of Health reports for the year 1890 as follows :

There have been 116,830 deaths reported during the year in the *Monthly Bulletin*, this including about 5000 returns of deaths that have been received up to the close of the year too late for insertion in the monthly issues. If to these are added 800 deaths, which are estimated, at the rate of 16 per 1000 population, to have occurred in rural towns aggregating 50,000 population, which failed to make any report, we have as the total mortality for the year 127,630 deaths. This gives as the death-rate for the year, 19.60 deaths per 1000 population, the population of the State being about 6,000,000.

The zymotic death-rate for the first six months is 124.18 per 1000 deaths from all causes ; of the last six months, 216.12, and of the entire year, 169.00. This is less than it has been for five years, the average zymotic mortality of which is 217.00 per 1000 deaths from all causes. This discrepancy is partly due to the epidemic of influenza which prevailed during the early part of the year, and which is estimated to have caused at least 5000 deaths, but few of which are credited to zymotic deaths. The actual zymotic mortality was, however, less than usual, being 19,753, that of 1889 being 22,179. Small-pox the State was almost entirely free from throughout the year, but two deaths, besides two in New York City, occurring in Cohoes and Dansville early in the year. Diphtheria has caused fewer deaths than in several years, the total mortality from this cause being nearly 1000 less than in 1889, and the death-rate from it has been diminishing for three years. It caused 4.2 per cent of all deaths. The largest mortality occurred in those districts having the largest city population. Typhoid-fever was lower than in either of the two preceding years, and caused about 1.3 per cent of the total mortality. Scarlet-fever caused hardly one third the actual number of deaths that occurred in either of the two years preceding ; there were about 15 deaths in each 100,000 population during the year. Measles caused more deaths than scarlet-fever, and a greater mortality than in either 1888 or 1889. From consumption there was a smaller proportion of deaths than usual, in each 1000 deaths 118.37 being from this cause. There were 18,000 deaths from acute respiratory diseases, which is greatly in excess of previous years ; a large proportion of the deaths from epidemic influenza fell upon this group, from which cause also the proportions of digestive, nervous and all local diseases were increased.

The reported mortality for January, 1891, is about 800 greater than that of the preceding month, the increase being in the maritime, Hudson Valley and Lake Ontario, and western districts. The mortality is less by 3000 than that of January, 1890, but there is no basis of comparison between these months, as about 4000 deaths occurred from epidemic influenza a year ago. The proportion of deaths from all zymotic diseases is a little less than in December, and less than the average for January for the past six years. There were more

deaths from scarlet-fever, measles, and whooping-cough than in December. Diphtheria and typhoid-fever caused fewer deaths; from the latter, however, there has been an epidemic prevalence during the month in Albany, Cohoes and Schenectady. Small-pox appeared in Jamestown, where a number of cases have occurred, the original case having come there from Newark, N. J.; one death has occurred. Cerebro-spinal-fever shows an increase of 19 deaths over last month. Acute respiratory diseases caused the same number of deaths as in December; from consumption there has been an increase of nearly 200 deaths. There is also a very considerable increase in the reported mortality from diseases of the urinary and circulatory systems, and deaths from old age and unclassified causes are likewise increased. A number of deaths have been returned from epidemic influenza from various parts of the State, and it is believed to have shown itself, though under conditions varying from those of a year ago. Mortality reports from 137 cities and large towns, having a total population of 4,280,000, give a death-rate of 21.50 per 1000 annually.

New York, 1,680,796: Total deaths, 3349—1243 under five years of age. Annual death-rate, 23.46 per 1000. From zymotic diseases, 506 deaths, and from consumption, 470.

Brooklyn, 852,467: Total deaths, 1588—642 under five years of age. Annual death-rate, 21.93 per 1000. From zymotic diseases, 257 deaths, and from consumption, 191.

Albany, 100,000: Total deaths, 210—50 under five years of age. Annual death-rate, 23.80 per 1000. From zymotic diseases, 43 deaths, and from consumption, 34.

Syracuse, 88,000: Total deaths, 96—32 under five years of age. Annual death-rate, 13.10 per 1000. From zymotic diseases, 12, and from consumption, 18.

Buffalo, 255,000: Total deaths, 413—172 under five years of age. Annual death-rate, 19.8 per 1000. From zymotic diseases, 72 deaths, and from consumption, 42.

Rochester, 130,000: Total deaths, 160—44 under five years of age. Annual death-rate, 12.00 per 1000. From zymotic diseases, 18 deaths, and from consumption, 24.

NORTH CAROLINA.—The State Board *Bulletin* summarizes the mortuary statistics of thirteen towns for the month of Jan-

uary, as follows : Population, 48,264 white and 41,562 colored. Total deaths, 128—66 colored and 25 under five years of age. From zymotic diseases there were 13 deaths, and from consumption, 15.

Wilmington, 21,000 : Total deaths, 32—0 under five years of age. Annual death-rate, 18.3 per 1000.

Raleigh, 15,000 : Total deaths, 21—0 under five years of age. Annual death-rate, 16.8 per 1000.

Asheville, 10,000. Total deaths, 18—7 under five years of age. Annual death-rate, 21.6 per 1000.

OHIO.—*Cincinnati*, 300,000 : Reports for January 505 deaths, of which number 146 were under five years of age. Annual death-rate, 20.2 per 1000. From zymotic diseases there were 86 deaths, and from consumption, 58.

PENNSYLVANIA.—*Philadelphia*, 1,064,277 : Reports that during the five weeks ending January 31st there were 1884 deaths, of which 615 were under five years of age. Annual death-rate, 18.4 per 1000. From zymotic diseases there were 229 deaths, and from consumption, 349.

Pittsburg, 240,000 : Reports 464 deaths during the five weeks ending January 31st, of which 161 were under five years of age. Annual death-rate, 19.8 per 1000. There were 73 deaths from zymotic diseases, and 41 from consumption.

RHODE ISLAND.—The number of deaths reported during January was 438, in a population aggregating 293,452. Annual death-rate, 17.8 per 1000. There were 39 deaths from zymotic diseases, and 43 from consumption.

TENNESSEE.—*Chattanooga*, 40,000 : Total deaths, 66—25 under five years of age. Annual death-rate, 19.8 per 1000.

Knoxville, 43,706 : Total deaths, 58—18 under five years of age. Annual death-rate, 15.92 per 1000.

Memphis, 64,586 : Total deaths, 105—18 under five years of age. Annual death-rate, 19.50 per 1000.

Nashville, 76,309 : Total deaths, 165—53 under five years of age. Annual death-rate, 25.94 per 1000.

WISCONSIN.—*Milwaukee*, 220,000 : Reports for January 345

deaths, of which 103 were under five years of age. Annual death-rate, 18.82 per 1000. There were 59 deaths from zymotic diseases, and 28 from consumption.

The cases of contagious disease reported to the Health Department during the month were : Scarlatina, 73 ; diphtheria, 147 ; typhoid-fever, 8 ; measles, 20.

VITAL AND MORTAL STATISTICS OF ENGLAND, 1889.

The Registrar-General's Fifty-second Annual Report, recently issued, gives the vital and mortal statistics for England and Wales during the year : Population, 29,015,613. Marriages, 213,865—14.7 per cent per 1000 living.

Births, 885,944—30.5 per 1000 ; the lowest birth-rate recorded in any of the last fifty years.

Deaths, 518,355—17.9 per 1000. In the preceding year the death-rate was 17.8 ; both these rates are by far the lowest since registration was established in 1837.

The proportion of deaths of infants under one year of age to registered births was equal to 144 per 1000, and slightly exceeded the average rate in the previous ten years, which had been 141 per 1000.

Of the 518,353 deaths from all causes registered during the year, 63,041 were referred to the principal zymotic diseases ; of these, 18,434 resulted from diarrhoea, 14,732 from measles, 12,225 from whooping-cough, 6698 from scarlet-fever, 5561 from different forms of fever (including typhus, enteric or typhoid, and simple and ill-defined forms of fever), 5368 from diphtheria, and only 23 from small-pox. These 63,041 deaths were equal to an annual rate of 2.17 per 1000, which was below the average rate from the same diseases in the preceding ten years.

'CHOLERA in the East, according to the most recent reports, is apparently rapidly disappearing. There has been no new case within a few weeks in Aleppo, Adana and Damascus. Two cases have been reported in Diarbekir, and five in Beyrouth.

The slight increase of the disease in Tripoli is not sufficient to cause alarm, at least, unless the heat should come in advance of the usual time and rekindle the epidemic.

LITERARY NOTICES AND NOTES.

ANNUAL REPORT OF THE SUPERVISING SURGEON-GENERAL OF THE MARINE HOSPITAL SERVICE OF THE UNITED STATES FOR THE FISCAL YEAR 1890.

A pamphlet of nearly four hundred pages, together with numerous plates, diagrams, and cuts illustrating the descriptive text of the latest improvements in hospital structures, lazarettos, and biological laboratories, at home and abroad ; comprising an excerpt and the practical application of recent laws on national and interstate sanitation, as related to State and local boards of health, and immigration ; the sanitation of ships and quarantine ; the management and statistics of the marine hospitals, and reports of clinical cases from hospital practice.

The report opens with a complimentary recognition of the vigilance of the State boards of health and the gratifying result to the country in its exemption from any epidemic during the year except *la grippe*. Briefs of this, cholera, small-pox, yellow-fever, and leprosy follow, with pertinent remarks on the importance of ceaseless vigilance for the prevention of such diseases.

Next follows an interesting study of cobra venom, as an alleged antidote to cholera, by Assistant Surgeon James J. Kinyon, at the laboratory of the Marine Hospital, Stapleton, Staten Island. His conclusion is, that "there is no antagonism between cobra venom and the poison of the spirillum of cholera."

The marine hospitals throughout the country are said to be in good condition, and the special report on them, by Surgeon Walter Wyman, shows them to be under skilled management.

Tabulated statistics show the growth of the service, measured by the number of the sick cared for, from 1868 to 1890, inclusive, to be more than fourfold—an increase from 11,535 to 50,671.

The total number of deaths in hospitals during the year was 492. The death-rate per 1000 treated in the hospitals of the several districts varied from 63 to 193; the average was 111.

The prevailing causes of death were: Tubercl., 113, or 23 per cent of the total number, besides "pneumonic phthisis," 20; pneumonia, 48; enteric-fever, 42; diseases of the heart, 25; diseases of the urinary system, 23.

The interest of the hospital treatment is enhanced by the clinical notes of a considerable number of the most important cases in detail, by the officers in charge.

The statistics of immigration show that, from June, 1875, to June, 1890, the number has increased from 227,498 to 445,-302, and the liability to the introduction of dependent immigrants and infectious diseases, from this source, in a corresponding ratio: demonstrating the importance of and the benefit to be expected from the inspection of emigrants at the ports of departure, recently instituted under the direction of the Surgeon-General of the U. S. Marine-Hospital Service, in conjunction with the consular service.

As a whole, the report is replete with matter of practical importance to all whose interest and business it is to concern themselves with the enormous trend of population, and its kind hither from abroad, and the effect of its dispersion on arrival; the sanitation of ships and seaports; the health of American seamen; the proper differentiation, as well as construction and equipment of hospitals and places of detention adapted to the various requirements—the relation of all these to the protection of the public health, and the necessity of co-operation by all sanitary authorities to that end.

A MANUAL OF PUBLIC HEALTH. By WINTER BLYTH, M.R.C.S., L.S.A. 8vo, pp. 675. Illustrated. Price, \$5.25. London and New York: Macmillan & Co.

A *manual* in the best sense of the word, deduced from the results of extensive practical experience, based upon a thorough knowledge of preventive medicine, adapted to the requirements and uses of the sanitary officer in both urban and rural districts.

It is divided into twelve sections: Statistics, comprising the calculation and significance of vital statistics, how to cal-

culate them, and their various purposes ; Air, Ventilation, and Warming—the general nature of air and importance of its purity, principles, and methods of ventilation, and the various systems of warming and their respective advantages ; Meteorology, meteorological instruments and how to use them ; Water-Supply, comprising its various sources, means of detecting impurities, and their interpretation ; Drains, Sewers, and Sewage disposal, distinctively, and their several relations to various conditions of locality ; Nuisances in all their phases, how they are constituted, and how to deal with them ; Disinfection and Disinfectants ; Zymotic (micro-parasitic) Diseases in general and particular, how they are propagated and how to restrict them, periods of incubation and differential conditions of locality and circumstances affecting their persistency and subsequent outbreaks ; Isolation Hospitals—site, construction, and regulations, and disposal of the dead ; Food and Diet, and food inspection ; Qualifications and duties of sanitary officers.

From beginning to end, mere theoretical methods and opinions, unsustained by practical results, are ignored ; the work deals exclusively with the useful and practical, and we take pleasure in commending it to all sanitary officers as the best work on practical sanitation hitherto published.

HEREDITY, HEALTH, AND PERSONAL BEAUTY. By JOHN V. SHOEMAKER, A.M., M.D., Professor of *Materia Medica*, *Pharmacology*, *Therapeutics*, and *Clinical Medicine*, and Clinical Professor of Diseases of the Skin in the *Medico-Chirurgical College of Philadelphia* ; Physician to the *Medico-Chirurgical Hospital*, Member of the *American Medical Association*, of the *Pennsylvania* and *Minnesota State Medical Societies*, the *American Academy of Medicine*, the *British Medical Association* ; Fellow of the *Medical Society of London*, etc. 8vo, pp. 437. Philadelphia and London : F. A. Davis.

The taking title of this book will doubtless attract the attention of a large number of readers in search of means to improve their appearance—*appearances* being a taking card, for better or for worse, in books as well as other things ; but they are sometimes deceiving. And the one before us is, to some extent, because the author, in virtue of his environment, dis-

plays much greater competency to deal with the subjects comprised in the title from their scientific aspect than he does to adapt them to the facile comprehension of non-scientific readers, for whom the work appears, at the outset, to be particularly intended.

He displays extensive reading on such subjects as the General Laws of Health, the Regulative Law of Life and Growth, Man's Spiritual Place in Nature, Man's Physical Place in Nature, Phenomena of Evolution in the Present Era, the Sentiment of the Beautiful, the Source of Beauty in the Fair Sex, the Effect of Environment and Training on the Physique, Grace, and Crown of Beauty, which are the titles of as many chapters of the thirty-seven into which the work is divided, some of which suggest the scope of a volume. It is not surprising, therefore, that a few of them are lacking in connective tissue—would have been better altogether omitted, or else treated in greater detail. The one merit (of good writing) of taking it for granted the reader knows something is, therefore, in this instance, overdone. If he is not versed in scientific works, he is likely to be overwhelmed with mere references to philosophical knowledge, without being able to deduce it from that which is before him.

But not so, by any means, in the latter portion of the work. In this the author falls into his accustomed rôle. When he comes to treat of the Skin as an Organ of the Body, and of other organs amenable to hygienic management or medicinal treatment—the use of the Bath, Cosmetics, Soaps, Clothing, Ventilation, Food, Circulation and Digestion, Household Remedies, etc., his physiological and pathological knowledge finds admirable application and lucid detail. Hence it is a good deal better book for the medical student or young physician than it is for the non-professional reader; but all may profit by it.

NOTES ON MILITARY HYGIENE, FOR OFFICERS OF THE LINE: A SYLLABUS OF LECTURES AT THE U. S. INFANTRY AND CAVALRY SCHOOL. By ALFRED A. WOODHULL, Major Medical Department, Brevet Lieutenant-Colonel U. S. Army. New York: John Wiley & Sons.

A pocket book of 150 pages, giving much information in lit-

tle space on the most essential conditions for the maintenance of personal health and healthful surroundings, with special reference to the vicissitudes of the soldier's life—clothing, food, water, habitation, and surroundings—and of all who camp out.

THE NEW YORK STATE REFORMATORY, at Elmira, as abundantly shown by the Fifteenth Annual Report of the Board of Managers, for the year ending September 30, 1890, continues to be, as compared with similar institutions elsewhere, the reformatory *par excellence*. Indeed, the similarity of any other institution, to our knowledge, either in comprehensiveness of groundwork, detail of practical knowledge, of physical and moral nature, or fruitfulness in salutary results, is feeble beyond measure. We had occasion to say of this institution six years ago (volume 14, p. 383) : "It is with cherished satisfaction that we recall our own personal observations, on a visit to this institution, and witnessed the singularly successful manner of conducting it in its varied benefits ; acquirement of trades, profitable occupation, education, and moral training. The contract system was at that time in practical and beneficial operation to the prisoner, as well as to the State. The law of 1884 has put an end to it, and new plans now have to be devised. Whether they will be equally beneficial is yet to be seen. But the Board of Managers of this institution is full of resources, and merits public confidence." While the Act referred to and additional legislation in 1889 considerably embarrassed the management for a time, they seem to have stimulated its resources. For, by the report now before us, "since the law excludes several kinds of employment carried on for earnings, and by the five per cent limitation it imposes many others are also shut out, it is believed that the ultimate effect will be good, inasmuch as the exclusion of some of the coarser prison industries will lead to the employment of inmates at higher and finer mechanical trades.

"Nearly all the expert work performed about the Reformatory, such as is usually entrusted to skilled men from the outside, is now done by the inmates themselves, pupils of the trade classes."

During the year, 1111 inmates have received trade instruc-

tion. Ninety-eight have graduated, and nearly all of this number have been released from the institution.

Of 324 inmates paroled during the year, one hundred and forty-eight went directly to employment at the trade learned here; one hundred and twenty-seven were provided with situations at other occupations, in expectation that they would, after a while, engage in the industry with which they became familiar in the trades-school, and forty-nine were temporarily placed in paid employment at the Reformatory.

Wednesday and Saturday afternoon in each week are devoted to military instruction and drilling, and dress parade is held every day, at evening closing time. During the past year, 1476 of the 1504 inmates have received more or less of military training.

All the inmates of the Reformatory are included in the graded school system of compulsory education, which is effective in its operation, and marked progress is made by the pupils, as is fully shown in the report of the Superintendent of Schools.

The school attainment of the 324 men paroled during the year may be summed up as follows: The percentage of illiterates among them has been reduced from 13.2 per cent to .7 per cent.

Recently, a new feature has been added—systematic gymnastics, not by any means as a privileged diversion, but for the practical advantage of men assigned to this treatment by the superintendent and the physician, and with such marked benefit in the improvement of the mind as well as the body, that other institutions should profit by the example. The physician reports: "The application of physical training has been extended until the gymnasium has come to be, for certain classes of defectives, a place of preparation for the schools of trades and letters and an auxiliary to the hospital. One hundred and twenty-eight men have received treatment in the gymnasium. Of this number, 43 comprised a class in training at the time the building was completed; and the balance, 85, were subsequently selected. The 85 men were placed in training for the following purposes:

Physical renovation and betterment, 63; intellection, 14; ethics, 8.

The first class comprised boys who were received into the Reformatory poorly nourished and anæmic, those reduced through personal vices and physical disturbances incident to puberty, the shop worn, and subjects of actual lesion or disease. For the first three varieties physical training is a reconstructive measure. The systematized exercise with the bath and massage improves nutrition, harmonizes corporal discrepancies, and induces general systemic improvement. It operates to overcome the hampering effects of a faulty physical organization upon the activity, the intelligence, and the will. For the third variety, subjects of certain lesions, an improved nutrition, resulting from increased powers of assimilation and waste, and brought about by an improved hygiene, operates more favorably than hospital care and chemical therapeutics. The effect of the bath and gymnasium upon the body and mind is more wholesome than the morbid atmosphere of a hospital, that in time induces an unconscious hypochondriasis and simulation of the symptoms of other patients. Selections have been made for functional cardiac trouble due to nervous enervation, sub-acute bronchitis, epilepsy, struma manifested in glandular enlargement and suppuration, incipient pulmonary disease, and cutaneous affections, as acne, seborrhœa and ichthyosis."

ESSENTIALS OF SURGERY, TOGETHER WITH A FULL DESCRIPTION OF THE HANDKERCHIEF AND ROLLER BANDAGE. ARRANGED IN THE FORM OF QUESTIONS AND ANSWERS, PREPARED ESPECIALLY FOR STUDENTS OF MEDICINE. By EDWARD MARTIN, A.M., M.D., Instructor in Operative Surgery, University of Pennsylvania; Surgeon to the Howard Hospital; Assistant-Surgeon to the University Hospital. Illustrated. Fourth edition, revised and enlarged. Price, \$1. Philadelphia: W. B. Saunders.

This Fourth and enlarged edition of the "Saunders' Question-Compends, No. 2," attests its value to students and junior practitioners as an excellent cramming and ready reference book on all the subjects comprehended in the title.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS.—January and February numbers of this excellent publication, as usual,

contain papers of timely importance to all medical practitioners—respectively: *Advances in Bacteriology*, by R. Koch, M.D.; *Formulary of New Remedies and New Medicinal Preparations*, by H. Rocquillon-Limousin; *Anæsthetics, a Discussion*, by Dr. William Macewin and others. *The Clinical Use of Prisms and the Decentring of Lenses*, by Ernest E. Madox, M.B.; *Electricity in the Treatment of Uterine Tumors*, by Thomas Keith, M.D., and Skene Keith, M.D., Edinburgh; *Ether Drinking—its Prevalence and Results*, by Ernest Hart. \$10 a year; single copies, \$1. William Wood & Co., New York.

“THE GREATEST THING IN THE WORLD.”—Professor Drummond’s famous address on “Love: the Supreme Gift,” sometimes called “The Greatest Thing in the World,” which has had a wonderfully large sale at thirty-five cents a copy, and has undoubtedly done a great deal of good, is now published by Alden, unabridged, in large pica type, for *three cents!* It ought, now, to circulate by the million. The same publisher issues Drummond’s “Natural Law in the Spiritual World,” in large type, fine “half-seal” binding, for thirty-five cents, plus postage, ten cents. These are two items characteristic of the 132-page Catalogue, which is sent free on request, by the publisher, John B. Alden, 393 Pearl Street, New York.

OUR ITALY, by CHARLES DUDLEY WARNER, being a description of the climate, resources, and scenery of Southern California, richly illustrated from photographs and from drawings by eminent American artists, is one of the many new books announced by Harper & Brothers for publication in the spring.

AUSCULTATION AND PERCUSSION, by FREDERICK C. SHATTUCK, M.D., Professor of Clinical Medicine in Harvard University, is a valuable addition to “The Physician’s Library,” published by George S. Davis, Medical Publisher, Detroit, Mich., at 25 cents a volume.

With a view to the necessary knowledge of the thoracic organs in health, before any departures therefrom can be correctly understood by the student, the work before us is prefaced with a description, illustrated by seven plates, of the

different aspects of the thorax, indicating the position of the organs and their relations to each other in their healthy condition, as a prelude to the Physical Signs in Health, which is the subject of the first chapter. Next follows the Physical Signs of Disease and, successively, of the different organs.

BETTER COWS, FIBRINE IN MILK, BACTERIA IN MILK, SILOS AND SILAGE, ALFALFA AND FIELD EXPERIMENTS WITH FERTILIZERS. Farmers' Bulletin, No. 2, U. S. Department of Agriculture, Washington, D. C.

A succinct summary of the results of experimental inquiries upon the several subjects enumerated in the title, by and under the direction of Professor W. O. ATWATER, the object being to indicate some of the ways in which the Agricultural Experiment Stations are endeavoring to aid the farmer.

SUNDY INVESTIGATIONS MADE DURING THE YEAR Bulletin XXV., of All the Divisions, Agricultural Experiment Station, Cornell University, Ithaca, N. Y.

A pamphlet of forty-eight pages, concisely summing up the analyses and other processes of examination of the various subjects reported upon during the year, together with a statement of the results in numerous tables, convenient for references and of practical utility to all who are engaged in such work.

THE ORIGIN OF THE ARYANS. By Dr. ISAAC TAYLOR. Parts I. and II. Pp. 198.

THE EVOLUTION OF SEX. By Professor PATRICK GEDDES and J. ARTHUR THOMPSON. Parts I. and II., pp. 295. Nos. 30, 31, 32, and 33, Humboldt Library of Science. Subscription price, \$3 a year; 30 cents a number. New York: The Humboldt Publishing Co.

Dr. Taylor's treatise comprises the gist of a profound study of the prehistoric ethnology and civilization of Europe; and while no attempt is made to the setting forth of new views on the still pending controversy among scholars of the highest repute, the conclusions drawn from modern researches deserve, as they should certainly receive, the attention of all philologists. The work is illustrated with numerous wood-cuts of anthropological and other archæological specimens from authen-

tic sources, comprising the most recent revelations of geological and archæological discovery.

The work on the Evolution of Sex is alike interesting to biologists. It presents a general outline of the processes of organic life, *ab initio*, with provision for its continuance and differentiation of sex and species, with such unity as the present state of biological knowledge renders probable, and applies this knowledge to the functions of individual life—those of the constructive and destructive changes of living substance. The work is divided into several parts or “Books”: I. Male and Female; II. Analyses of Sex—Organs, Tissues, Cells; III. Processes of Reproduction, and IV. Theory of Reproduction, all thoroughly illustrated and tersely described.

THE TEACHING AND HISTORY OF MATHEMATICS IN THE UNITED STATES. By FLORIAN CAJORI, M.S. (University of Wisconsin), formerly Professor of Applied Mathematics in the Tulane University of Louisiana, now Professor of Physics in Colorado College. Bureau of Education, Circular of Information, No. 3, 1890. Pamphlet, pp. 400. Washington: Government Printing Office.

A monograph of particular interest to all teachers and students of mathematics, and a valuable contribution to the history of education in this country from and since colonial times.

INSECTS INJURIOUS TO FRUITS, AND THE CLOVER RUST: Bulletins XXIII. and XXIV., Agricultural Experiment Station, Cornell University, Ithaca, N. Y. These pamphlets doubtless will, as they should, attract the attention of all farmers wide awake to knowledge promotive of their interest, and of agriculturists generally.

THE RIGHTS OF CHILDHOOD.—Every child has a right to as cheerful a childhood as it is in the power of those standing near her to give; and every child has a right to something as valuable and necessary as food for her bodily growth, and that is food for her spiritual growth. None of the demands of fashionable or of political or of any other sort of life should be allowed to interfere with her receipt of it. This food she cannot receive if left to lower companionship than that to which



she is entitled—to solitary life with one teacher, however refined that teacher may be ; to exile from the daily life and thoughts of her father and mother ; or if her mother sees her only in the hours of fatigue from pleasure, and never for any length of time when her faculties are brightest and at their best, and her own higher nature ready to impart its strength to her child.—*Harper's Bazar.*

“ THE FAITH DOCTOR.”—Dr. Edward Eggleston has been preparing material for years on the subject of his novel, “ The Faith Doctor,” in the *Century*, the scene of which is laid in New York City. In addition to the main subject of the novel, the author touches upon the “ social struggle” in a very fresh and interesting way.

PAPER GAS-PIPES for distributing services in buildings, it is reported by the *American Gas Light Journal*, are finding favor in Philadelphia. The pipes are composed of strips of manila paper, equal in width to the length of the pipe to be made, the paper being subjected to a bath of asphalt. It is then wrapped firmly and evenly around an iron core until the required thickness is obtained. The pipe is then subjected to a heavy pressure, after which the exterior is sanded and the pipe is bathed in water. The core is then removed, and the interior is coated with a waterproof composition.

IT is shrewdly suspected, from the persistency with which the *Druggists' Circular* keeps that \$200,000 damage suit before the medical public, that the affair is a fake gotten up between the Standard Oil Company, owners of the *Circular*, and Radam, of “ Microbe Killer” fame, for the purpose of working the medical press for free advertising.—*St. Louis Medical and Surgical Journal.*

PAMPHLETS, REPRINTS, REPORTS, ETC., RECEIVED.

School Hygiene ; also, a Study of the Action of Alcohol on the Human Body. By Professor Delos Fall, Member of the State Board of Health of Michigan. Albion, Mich.

Address to the Association of Public Sanitary Inspectors of Great Britain, Northwestern District, by the President, at the Third Annual Dinner, Liverpool, December 13th, 1890.

The Treatment of the Morphine Disease. By J. B. Mattison, M.D., Home for Habitues, Brooklyn, N. Y.

Triple Narcotic Addiction—Opium, Alcohol, Cocaine.—*Ibid.*

The Social Evil. Some Observations on its Causes, Progress, and History. How far is Woman Chargeable with its Existence? By P. C. Remondino, M.D., San Diego, Cal.

The Thomas Hip Splint. By John Ridlon, M.D., New York.

Disposal of Sewage. By Rudolph Hening, Civil and Sanitary Engineer, New York.

Higher Medical Education, and How to Secure it. By Richard H. Lewis, M.D., Raleigh, N. C.

Helps to a Higher Evolution. By George F. French, A.M., M.D., Minneapolis, Minn.

Pulmonary Phthisis Treated by Inoculation with Animal Virus. By J. Hilgard Tyndale, M.D., New York.

Antiseptis and Asepsis Before and after major gynecological Operations. By Howard A. Kelly, M.D., Professor, etc., Johns Hopkins University, Baltimore, Md.

Third Annual Report of the Methodist Episcopal Hospital, 1890, Brooklyn, N.Y.

Fortieth Annual Report of the State Lunatic Asylum, at Harrisburg, Pa., September 30th, 1890.

The Medical Profession as a Public Trust. Address by John G. Orton, M.D., President of Binghamton, N. Y., at the Seventh Annual Meeting of the New York State Medical Association, October 22d, 1890.

One Hundred Consecutive Cases of Labor at the Maryland Maternity. By George H. Rohé, M.D., Director, and William J. Todd, M.D., Resident Physician, Baltimore.

Provision for Idiotic and Feeble-minded Children. By Isaac N. Kerlin, M.D., of Elwin, Pa. "The State's Duty Toward Epileptics," by George K. Knight, M.D., of Lakeville, Conn. Two Papers read at the Thirteenth Conference of Charities and Correction, at St. Paul, Minn., July 21st, 1886, and Discussion.

Malaria and the Causation of Intermittent Fever. By Henry B. Baker, M.D., of Lansing, Mich.

Public Health and the Land Question. By George Homan, M.D., of St. Louis, Mo.

THE SANITARIAN.

APRIL, 1891.

NUMBER 257.

THE SYMPTOMATIC SIGNIFICANCE OF BLACK VOMIT.

THE MICROSCOPICAL, SPECTROSCOPICAL, AND CHEMICAL ANALYSIS OF BLACK VOMIT AS AN AID TO HEALTH OFFICERS IN THE DIFFERENTIAL DIAGNOSIS OF YELLOW FEVER AND MALARIAL FEVERS.*

By GEORGE T. KEMP, M.D., Ph.D., Hoagland Laboratory, Brooklyn, N. Y.

TWO years ago I undertook, at the suggestion of Dr. Sternberg, a chemical and spectroscopical examination of the black vomit of yellow fever, in order to determine the source of the pigment to which the color of this vomit is due. While carrying on this work, it happened that I was able to obtain some black vomit from cases of those malarial fevers which sometimes simulate yellow fever so closely as to give difficulty in making a positive diagnosis. Two specimens of black vomit, which I obtained from malarial cases, presented certain characteristics in common, and were also markedly different from the vomit of five cases of undoubted yellow fever, so that I undertook a careful study of the question in hopes of discovering differences in the vomit of yellow fever and of malarial fevers respectively, differences which could easily be determined by the spectroscope if not by the microscope, and which would enable a health officer, upon the arrival of a questionable case in his city, to assure the people that the case was not one of yellow fever, or in event of the opposite diagnosis, to determine without delay what action to take in the matter.

* Read at the meeting of the American Public Health Association at Charleston, S. C., December 17th, 1890.

A spectroscopic analysis of the black vomit of all five cases of undoubted yellow fever showed beyond question the presence of black pigment, and failed to detect any other pigment. In three out of the five cases the characteristic absorption bands of oxy-hæmoglobin were plainly seen, showing that the blood had not all been decomposed by the action of the juices in the stomach. In the other two cases the pigment was present as methæmoglobin. In all five cases, treating with acetic acid gave acid-hæmatin, rendering alkaline with ammonia gave alkaline-hæmatin, and reducing this with Stokes's fluid gave the characteristic double bands of reduced alkaline-hæmatin. This latter is the most satisfactory test when the pigment existed in the vomit as methæmoglobin. The vomit, though distinctly acid in all five cases, was not sufficiently so to transform the pigment into acid-hæmatin. In all the cases of undoubted yellow fever, blood corpuscles could be detected in the vomit by the use of the microscope, though I do not insist upon their being universally recognizable, as competent observers, working on a larger number of cases, have sometimes failed to find them. They are usually found in clumps, and the individual corpuscles may be detected on the edge of such clumps, or detached and lying in the vicinity. The vomit from all five cases contained distinct coffee-ground flakes in a clear liquid, which, in two cases, after being kept for some time, acquired a distinct red color from oxy-hæmoglobin. It did not contain bile, although the quantity obtained for analysis was always too small to make a satisfactory examination for this by isolating the pigments and bile salts.

THE BLACK VOMIT OF MALARIAL FEVERS.

The black vomit of malarial fevers was never as acid as that of yellow fever, and was always more or less grumous and of a muddy brown, with a faint suggestion of a greenish tint. It always contained bile salts as well as bile pigment. Microscopical examination showed clumps of brownish material, in which altered blood corpuscles might have been detected, but never without a slight draught on the imagination. Leucin and tyrosin crystals were abundant in one specimen, and sparse in another. Clumps of brownish, radiating, rod-like structures were seen in both cases. These sometimes strongly

resembled tyrosin crystals in their arrangements, but on treating with dilute caustic potash, the pigment only was dissolved out, leaving behind clumps of bacilli, which broke up into individuals under the action of the caustic potash.

The spectroscopical examination in neither case revealed oxy-hæmoglobin, which would have shown the presence of undecomposed blood. On treating with acid, and then with alkali and Stokes's fluid, however, the absorption bands of reduced alkaline-hæmatin were obtained, showing beyond question the presence of altered blood-pigment here as well as in yellow fever. Once in each specimen, while examining for the spectrum of acid-hæmatin, I saw a band which had not been described as belonging to blood-pigment, and which I had hoped would possibly yield a constant point of difference which could always be detected ; but I was subsequently convinced that this was most probably a modified derivative of the bile pigments, and the question resolved itself into the determination of the presence of bile, which can be done more easily than by the spectroscope. In short, therefore, the chief source of pigments in the black vomit of yellow fever, and also of malarial fevers, is the pigment of blood acted on by the juices of the stomach. In addition to this the vomit of malarial fevers contains both bile-pigments and bile-salts in considerable quantity, showing that the regurgitation of the bile into the stomach in malarial fevers is the rule, while in yellow fever (after the first few days) it seldom or never occurs. I find, by referring to authorities, that the secretion of bile is greatly diminished in yellow fever, and Schmidt says it may even be suspended. If, therefore, a patient with black vomit is brought in, who is not in a condition to give an intelligent history from which to make a diagnosis, but who is known to have been sick for several days, an examination of the black vomit may help us considerably in determining whether or not we have yellow fever to deal with. If the vomit is markedly acid, and is composed of coffee-ground flakes in a clear, colorless yellow or red fluid—if these flakes are seen to contain red blood corpuscles which can be distinguished as such, and if the vomit contains no bile (especially bile salts)—we have probably a case of yellow fever on our hands. If, on the other hand, the vomit is feebly acid, thick, grumous, and of a

dirty brownish-green color, and if a careful chemical examination shows the presence of bile more or less abundant, the probability is that we have to deal with a malarial fever.

I have not deemed it necessary to tire the Association with details of physiological chemistry involved in these examinations; they can be found in standard works on the subject.

I regret not having had a larger run of cases, from which I might possibly have drawn more definite conclusions; but cases of malarial fever with black vomit are rare—at least, we get very few of them in New York—and, as I may not be able, in the future, to continue my investigation on this subject, I thought it best to present this short account of what I had done, hoping that others would take up the work along the same line, and feeling sure that I have offered for differential diagnosis something suggestive, though not conclusive. That blood is the only constant source of the pigment in black vomit of yellow fever, I regard as settled beyond doubt. There may be, at times, pigment produced by chromogenic bacteria or other pigments; but these are not constant, and are purely accidental complications.

I reserve for special report a case which I examined this Fall at the Quarantine Hospital on Swinburne Island, in New York Bay—and here I would take occasion to express my appreciation of the kindness of Dr. Wm. M. Smith, Health Officer of New York, who not only allowed me to fit up a laboratory for making these investigations at the Quarantine Hospital, but showed me every courtesy, and gave me every assistance possible during the prosecution of my work. The case came in on a steamer from various West Indian ports, all of which furnished a clean bill of health. The crew had landed at only one port (Cienfuegos), which, as above stated, was declared to be free from disease. The patient was taken sick while at sea, but was up and down and on deck every day during the voyage. He was sent first to the Marine Hospital, and thence to Quarantine. Admitted to the latter, the patient seemed dull, but could be roused to talk connectedly and answer questions intelligently; skin and sclerotic slightly jaundiced; tongue dry, brown on margins, and morbidly clean; dry in centre; pulse 100°; temperature 101°; respiration 25; urine about normal in quantity—markedly albumi-

nous. Patient grew progressively weaker; did not vomit. Nausea felt once after taking nourishment. Had convulsion—probably uræmic—and died during the night (3 A.M.). This history was given to me by Dr. Smith. When the telegram reached me, announcing a case at Quarantine, I was out of the city, and did not arrive until 9 A.M. the next morning, five hours after his death. From the appearance of the patient, and the scant history, Dr. Smith was inclined to doubt its being yellow fever, in spite of the albuminous urine. He was of the same opinion after seeing the gross pathological lesion at the autopsy. The patient had never had black vomit, but a quantity of a dark-brown, grumous material was found in his stomach, and this answered exactly the description I have given of the black vomit of malarial fevers, except in the absence of clumps of brownish bacteria, which were decolorized and floated apart under treatment with dilute caustic potash. Bile was present—both bile salts and bile pigment. There were many more epithelial cells from the stomach's mucous membrane than I had ever seen in malarial vomit. From an examination of the vomit alone, if the man had vomited this matter, I should have thought the case more probably a case of malarial fever, thus agreeing with Dr. Smith.

From a microscopical examination of the liver, spleen, and kidney, however, I was led to think otherwise. The liver was fatty (which is the rule in yellow fever and the exception in malarial fevers), *and did not contain dark pigment granules.* *The spleen was not enlarged, and was free from the pigment so characteristic of malaria.* The kidney showed acute parenchymatous nephritis, and the urine contained albumen and granular casts. From these findings I must say that I regard the case as one of genuine yellow fever. The contents of the stomach, as far as bile is concerned, certainly came fully within the description which I have given as throwing the chances in favor of a diagnosis of malarial rather than of yellow fever, and if the case is one of genuine yellow fever, I must cite it as an instance in which the test I suggested did not hold good. On the other hand (as Dr. Smith is still of the opinion that the case is not one of yellow fever, and as his experience with yellow fever is a very large one, extending

over a number of years, and far exceeding my own), I may take the liberty of quoting him against myself in the diagnosis of this case, and say that if he is right and I am in error, the test still holds good. I have tried to obtain a fuller clinical history of this case before it reached Quarantine, but up to this time have been unable to do so. A full clinical history would do much to settle the diagnosis.

In conclusion, I must again call attention to the fact that this work does not claim to furnish a hard-and-fast test for differential diagnosis, but is simply an account of some unfinished work, which I shall probably have to abandon, which has thus far led to suggestive results, and which I now bring before you, hoping that others who may take up work in this field in the future may find them of service.

The following communications have been received, in reply to requests for further information on the case, since the foregoing account of it was read at the Charleston meeting :

U. S. MARINE HOSPITAL SERVICE,
MIDDLE ATLANTIC DISTRICT, PORT OF NEW YORK, }
STAPLETON, Dec. 15, 1890. }

DEAR DOCTOR KEMP: Your letter of the 12th inst. is at hand. I am sorry at the delay. . . . You have not given any Charleston address, so I send this to the American Public Health Association. I enclose you a memorandum of the case, such as you require. I do hope that it may reach you in time.

Sincerely yours,

JOS. J. KINYOUN.

W— C—s, æt. 22, Ireland, seaman, of S. S. S—, admitted to Marine Hospital, New York, October 18th, 1890, and gave the following history: Landed in Cienfuegos ten days before, when he and a shipmate went ashore. On the sixth day thereafter, while at sea, he was seized with a chill lasting him for about an hour; this was followed by a fever, from which he was suffering on admission to hospital.

From the inception of the disease he has been troubled with nausea and vomiting; pains in the back and limbs; he gives a history of having chilly sensations, but no rigor; has never had any remission followed by sweating. (This was confirmed by his shipmates.) Physical examination: The skin was of a

peculiar yellow color; eyes injected, and scleris, tinged with yellow; expression apathetic; tongue pointed, and covered with a light fur; great pain and pressure over the liver and spleen, also tenderness over the whole of abdomen; spleen not notably enlarged; urine scanty, loaded with albumen, and contained a large number of casts. Patient has not slept any since the attack came on.

	October 18th. Morning.	Evening.	19th. Morning.	Evening.
Temperature,	37.4	38.2.....	38.2	38.2
Pulse,	72	78.....	72	72
Respiration,	16	14.....	18	19
Urine, twenty-four hours,	365cc.			

Transferred to Quarantine, October 21st, 1890.

J. J. K.

HEALTH OFFICER'S DEPARTMENT, STATE OF NEW YORK,
QUARANTINE, S. I., March 17, 1891.

To Dr. George T. Kemp:

DEAR DOCTOR: Your communication in relation to the case in question was received while I was too ill to make any acknowledgment or reply.

I have made a very careful study of this man's case.

The deputy relied upon the declaration of the captain and purser of the ship, that there had been no sickness during the voyage, to which declaration the captain fixed his sign manual, and the usual inspection of having the crew pass before the doctor on calling the roll.

If the disease was yellow fever I had determined to prosecute the captain, and was quite anxious to determine the truth of this for the purpose of holding him to a strict accountability and punishment.

My reasons for considering the case one of "pernicious remittent fever" I give below. In this place let me say in reference to the spleen, that while it was not characteristic of malarial fever, as shown by the autopsy, the weight exceeded the average by $2\frac{1}{2}$ ounces. In the case of C—e, his associate fireman, who was taken at the same time as C—s, and died in Brooklyn about the same time that C—s died, those who made the autopsy state that the spleen was seventy per cent larger than normal.

The symptoms in the case of C—s warrant the conclusion

that the man died of "pernicious remittent fever," complicated by constitutional and acquired conditions. Many of the symptoms of yellow fever were absent, and those which indicated that disease were not improbably the result of lesions quite independent of that disease. This conclusion is reached in view of the following facts :

First, the time of the invasion of the disease was very certainly determined by the patient's story (and it was confirmed by the chief engineer), to be the evening of the sixth day after leaving Cienfuegos. This was the only place where the man was on or near the shore until he reached Nassau. This time exceeds the incubative period of the disease of yellow fever. Five days have been considered as the extent of the danger line in the development of this disease under the administration of my predecessors at the New York Quarantine, as it has in that of the present health officer.

During the eleven years past vessels from infected ports, during the infectious season, have only been detained until five days have elapsed from their departure from the infected port. Hundreds of voyages have been made each year during this period by steamers that come from infected ports in the West Indies to this port, and they have only been required to complete five days at Quarantine before proceeding to the wharves of the city. Not a case of the disease has ever developed after the expiration of that time. In the few instances that have occurred in which cases of yellow fever have been discovered after passing Quarantine, it has been found that the invasion period of the disease occurred within five days after a possible exposure to the infection, and was concealed at Quarantine by the officers of the steamer, or by the patient himself. Experience and pretty careful observation have established the conviction that the infection of yellow fever has a period of incubation as definite as small-pox, measles, and other contagious diseases ; and that the period for yellow-fever is *less* than five days. Instances have been given in which the time of both the reception and the development of the infection was well established. * In every instance referred to the period of incubation was less than five days.

In those cases in which the development of the disease has been apparently prolonged, the invasion is so mild that the

patient himself misapprehends the character of the disease, and does not complain to friends, or, if on shipboard, does not report to the proper officer of the vessel.

Second, some consideration must be given to the fact that the United States Consul at Cienfuegos had given clean bills of health during the past season. However derelict at some of the West Indian and South American ports consuls may be in giving a full and correct report of the infectious and contagious diseases at the ports where they are accredited, this cannot often be charged to our consuls at Cuban ports. Their reports have been uniformly full, and they have been faithful in the discharge of this important duty.

Third, the disease in C—'s case was ushered in with a chill, followed on several successive days by chills of greater or less severity. This was the statement of the patient when admitted to the Quarantine Hospital, and it was confirmed by the engineer.

Chills in the invasion of yellow fever, or at any subsequent stage of the disease, are as infrequent as is their absence in intermittents; and when they do occur, they are doubtless associated with malarial conditions to which the system has been subjected previous to, or in connection with the exposure to the infection of yellow-fever.

There is in uncomplicated yellow-fever an entire absence of periodicity. In fevers which have a malarial origin, although differing much in their type, there is no characteristic so marked as pyrexial remissions and acerbations. In yellow fever there is an entire absence of any remission such as chills indicate. When the only paroxysm of fever passes away, the one and only remission that succeeds terminates in convalescence or the collapse which precedes death.

Fourth, the disproportion between the temperature and the pulse usual in yellow fever did not exist; on admission the temperature of the patient was 101° and the pulse 90°. A high temperature and relatively slow pulse are characteristic of yellow fever. When the temperature is 103° to 105° F. the pulse is frequently 80° to 90°.

Fifth, the secretion of urine after admission to the Quarantine Hospital was fully up to the average in other fevers; at death the bladder contained about 14 ounces of urine.

In severe cases of yellow fever there is no symptom more common than a very scanty secretion from the kidneys ; and in most fatal cases there is a total suppression for hours at least, and in some instances for a day or two previous to death.

Sixth, the nausea and vomiting, which occurred during the early stages of C—'s case, were entirely absent after his admission to the Swinburne Island Hospital. In yellow fever this is usually not only an early, but a persistent symptom until death ensues ; and in most cases the ejecta toward the end has the characteristic "coffee-grounds" appearance—in other words, the ejecta is composed for the most part of mucus and the broken-down blood corpuscles which have been discharged from the capillaries of the mucous membrane of the stomach.

Seventh, there was no evidence shown by the autopsy of infiltrations from the capillaries of the sub-mucous membrane of the stomach, and none of the dark patches of extravasation which exists, and often colors a large portion of the mucous membrane of the stomach in cases of yellow fever attended by "black vomit." The cardiac end of the stomach was congested ; the capillaries were enlarged and distinctly traceable ; there were no echymosed spots ; the congestion seemed such a result as mechanical irritants produce ; and the opinion formed at the time was that it was one of many evidences of the habitual excesses of the man during life. The congestion was not characteristic of the pathological conditions found in cases of yellow fever.

Eighth, the contents of the stomach were feebly acid, and the urine had a slightly acid reaction. In yellow fever the secretions are much more acid than in normal conditions.

The albuminous condition of the urine was one of the symptoms most suspicious of yellow fever. While this condition always strengthens the presumption which other symptoms create, it is, however, not a diagnostic symptom or condition.

Other diseases than yellow fever have this albuminous condition of the urine ; it is not unfrequently found in cases of tropical fever. The following instances are interesting as illustrating this statement :

The Medical Officer of the steamship C— of the Pacific

Mail S. S. Co., passed Quarantine the 14th of June, 1889. He was taken ill the 8th of the same month, when *en route* from Aspinwall. The attack was ushered in with a chill, and succeeded by a temperature of 104° F.; for several days subsequently the remissions and pyrexia were well marked. After he arrived at his home in Brooklyn the health authorities of that city conceived that the disease from which he suffered was yellow fever, and directed his removal to the Quarantine Hospital. The doctor was received there early on the 20th. When he was admitted there were no symptoms of yellow fever except the presence of albumen in the urine. Under the use of salines the albumen soon disappeared, and his convalescence was established.

E. D. C.—arrived at Quarantine, May 30th, 1889, on a steamer from Mexican ports, and touched at Havana. This man came on board at Tampico, where there had been no yellow fever for a long time previously, and did not go ashore at any infected port *en route* to this port. He was seriously ill on arrival at Quarantine, although able to be on deck most of the time. This man died on the 7th of June following, eight days after admission to hospital. The symptoms in this case clearly indicated "pernicious remittent fever." The skin became jaundiced after admission. The secretion of urine was moderately free, and contained thirty per cent of albumen from the time of admission. Portions of the liver, spleen, and kidneys were submitted to the pathologist of the New York Hospital—Dr. Frank Ferguson—for examination. The above diagnosis was unqualifiedly confirmed by Dr. Ferguson.

Very truly yours,

WM. M. SMITH,
Health Officer.

"IMPERMEABLE GLUE," says the *Revue Industrielle*, "may be made by soaking ordinary glue in water until it softens, and removing it before it has lost its primitive form. After this, dissolve it in linseed oil over a slow fire until it is brought to the consistency of a jelly. This glue may be used for joining any kind of material. In addition to strength and hardness it has the advantage of resisting the action of water."

THE WEST COAST OF AFRICA—"THE FEVER."

SANITARY REPORT FROM THE U. S. S. PENSACOLA, BY MEDICAL INSPECTOR C. H. WHITE, U. S. NAVY.

Abstract from Report of the Surgeon-General, U. S. Navy, 1890.

WE left New York, October 16th, 1889. The crew was vaccinated and the descriptive lists verified. The men were all instructed in the use of the tourniquet.

The expedition having delayed its departure to so late a date, all despatch was required, and we only stopped just long enough to get coal on board at the following places, viz. : Azores, Cape Verde, Free Town, and Elmina—the two latter being on the mainland. Our stay was so limited at each of these places that no satisfactory information could be obtained in regard to the sanitary condition of these places or the diseases most prevalent therein. As far as I could learn, the Azores and Cape Verdes were free from any objection in point of salubrity, and I could learn no reason for the restrictions still in force in regard to remaining on shore at night at the Verdes. Not so, however, in regard to the other ports, Free Town and Elmina on the mainland. The testimony of all whom we met ranked these places unhealthy and to be avoided.

At Elmina I met two surgeons connected with the English service. They said there was but one disease on this coast to be considered, viz., *The Fever*; that everybody has it, and expects a return of it; that new-comers are often attacked a few hours after their arrival; that at some seasons, the present, for instance, it assumes in many cases a particularly virulent aspect, characterized by kidney congestions and hæmaturesis, and from the consequent color of the urine is commonly known as "Black-water-fever." For treatment they could recommend nothing beyond a dependence on quinia, though this seemed of little use in bad cases. The bad cases all die, *i.e.*, when one gets very sick he does not rally.

As England gives a real protection to countries and colonies which she claims, she necessarily keeps an efficient naval force on this coast and in the larger rivers. Though these vessels are relieved frequently, they suffer greatly from the fever. Of a party of sixty that was landed a short time ago to protect a native village, and which remained on shore only a few hours, fifteen were attacked. During the three months preceding our arrival, three commanding officers of English gun-boats died from African fever. The natives suffer very little, and it seems probable that they and their descendants will ever people the region of tropical Africa. The foreigner may occupy the elevated plateaus and manage large plantations, but the natives must do the work, as they alone are proof against the climate.

We arrived at St. Paul de Loanda, December 6th.

This place has from 15,000 to 20,000 inhabitants—Portuguese, negroes, and mixed. The town is divided in two distinct parts, viz., the “low” and the “high.” The low borders the bay, and here all the business of the place is conducted. The streets are broad and indifferently paved, and bordered in places by sidewalks. Here and there are large baobab trees, in the shade of which the restful natives are ever lounging, some with fruit to sell, or with fish, or with trinkets, and all happy.

One is struck as one walks along the street by the number of blind people (natives) met. They are led in couples, and often in larger numbers, by a child, who conducts them to every stranger they meet for alms. The cause of this frequent blindness I could not satisfactorily discover. The belief among the intelligent English of whom I inquired is that it is the result of the administration of some native vegetable poison, prepared by the “fetish” men, and by them kept a profound secret. This poison is said to produce death usually, but failing this, various paralyses may occur, disabling the victim.

The natives themselves are wholly uncommunicative on this subject, nor promises nor threats will induce them to obtain a sample of the poison itself or of the plant producing it. This vague statement with regard to the belief in poison being the cause of the numerous cases of blindness would not be worth

record were it not paralleled by facts concerning the “ordeal poison,” which is frequently resorted to by these natives to settle questions of guilt. “Casca” is the African name of the “ordeal” bark, and it was a long time before samples of it could be obtained for recognition. It is now known to be from the *Erythrophlæum Guineense*, an irritant poison, producing vomiting, purging, dimness of vision, giddiness, convulsions, and death. The belief in the existence of the sight-destroying and paralyzing poison referred to above is general among the foreign residents here, and the names of individual foreigners were mentioned who had been victims of this poison, administered in revenge or jealousy by their black mistresses.

They have a new hospital here built by the Portuguese Government on the elevated land at the back of the town proper. It consists of four buildings of single story, connected by central corridor. The front building accommodates the administrative department. Although the building is kept moderately clean, yet it presents on the whole an appearance of untidiness. About two hundred and fifty patients could be accommodated, but at the time of my visit only half that number were inmates. Statistics of mortality I could not obtain, and I believe very little attention is paid to such matters by the authorities. I mentioned in my former report that three of the enlisted men and three of the members of the “eclipse expedition” had gone to the interior collecting specimens for the Smithsonian Institution, and had not returned at the date of my report. They all reported on board about January 5th, and five out of the six were promptly attacked by remittent-fever. None of the cases were severe or protracted, and complete recovery has resulted in every case. We left St. Paul de Loanda, January 6th, arriving in Cape Town, January 17th.

The situation of Cape Town in the line of maritime traffic, and it being the chief port of South Africa, causes it to be visited by vessels from all parts of the world that have occasion to round the Cape, as well as by the regular steamers that connect it with Europe and the numerous African ports. It is particularly exposed to epidemic and contagious diseases, and seldom a year passes that some disease does not prevail

epidemically. In 1888 croup, diphtheria, erysipelas, scarlatina, and measles were pronounced epidemic, and though in no instance was the epidemic regarded as severe, still the aggregate death-rate was 38, and so greatly in excess of what it should be in a town situated in so healthful a locality as Cape Town.

During our visit influenza (*grippe*) was prevailing, not only in Cape Town, but in the adjacent towns, and as far as I could learn through the whole of Cape Colony. In character the epidemic maintained its usual features in other places, a few deaths occurring from intercurrent pneumonia and other more obscure causes. Although the U. S. S. Pensacola was behind the breakwater alongside the dock, and free communication with the shore maintained, visitors freely allowed aboard and the men granted liberty daily, yet no case of influenza occurred among the officers or crew. I am at loss to account for the immunity we enjoyed when the residents of the city were so affected.

During the summer months enteric-fever prevails here to a large extent, engrossing at times the accommodations of the hospitals and necessitating the erection of tents for the overflow. That the prevalence may be due in a measure to bad drainage is probable, for such condition exists. If such be the case the authorities are sadly to blame, as the situation of the town on the slope of Table Mountain gives every opportunity for proper drainage.

Matters of health, the regulation of hospitals, the granting of licenses to practise medicine and dispense medicines, and the care of paupers, lunatics, and lepers are placed in the hands of the colonial medical committee. Lock hospitals are maintained, and while prostitution is not formally recognized, yet examinations of prostitutes are made when such persons are known. Judging from the results observed after general liberty given here to our crew, syphilis is not as prevalent as in most maritime towns.

The laws of the colony do not compel the segregation of lepers. The subject has been agitated, and without doubt some definite action will soon be taken, as the disease is becoming so prevalent as to alarm the public.

THE EDUCATIONAL BURDEN OF THE SOUTH.

"THEY gave us a hard tussle," was the remark of a Northern general to a passenger about the Southern soldiers of the late war. "We met those people on the battle-field through four dismal years, when they earned a reputation for good fighting, which has made the name of our American soldiery illustrious." So says Dr. Mayo, and he knows by intimate acquaintance what he is talking about. But we do not realize what a load this very South is now carrying. The emancipation of the slaves threw upon them a tremendous burden, and introduced them into a new order of things totally unlike anything before known. And then when these emancipated slaves were made voters another item of tremendous importance was added to the count. What did the South do? Sit down and grumble. Far from it, but like the brave men and women they were, they went at the work of reconstruction with a will and a vim that showed that they had genuine Anglo-Saxon blood in their veins. Now after a quarter of a century of work, what do we see? Many things; chiefly these:

A public system of instruction in every Southern State, as well administered as anywhere in the land.

A band of devoted teachers who are studying professional branches, and thoroughly in earnest to make their work equal to any on earth. Several of the leaders among these teachers have studied abroad, and brought home with them the culture and learning that comes from contact with other modes of thought and speech.

A thorough belief in the potency of education to raise the races of men to a higher plane of civilization.

These three items are of no small moment, and all who know the South know that they are true counts. The South admits that they have a great deal yet to do—in fact, that they have but just begun to do what is to be done. But does not the North admit this too? The real work of public education is but just begun everywhere, and is much farther along,

generally, in the North than in the South ; but considering the times, circumstances, conditions, and results, every fair-minded observer must concede to our Southern brethren the praise of having done more than any other people ever did under the same conditions and with the same means.—*New York School Journal.*

THE EFFECT OF TOBACCO-SMOKE ON MEAT.—Cases of poisoning due to meat which seemed thoroughly wholesome have sometimes occurred, and have remained unexplained. In the *Revue d'Hygiène* M. Bourrier, Inspector of Meat for Paris, describes his experiments with meat impregnated with tobacco-smoke. Some thin slices of beef were exposed for a considerable time to the fumes of tobacco, and afterward offered to a dog which had been deprived of food for twelve hours. The dog, after smelling the meat, refused to eat it. Some of the meat was then cut into small pieces and concealed within bread. This the dog ate with avidity, but in twenty minutes commenced to display the most distressing symptoms, and soon died in great agony. All sorts of meat, both raw and cooked, some grilled, roasted, and boiled, were exposed to tobacco-smoke and then given to animals, and in all cases produced symptoms of acute poisoning. Even the process of boiling could not extract from the meat the nicotine poison. Grease and similar substances have facilities of absorption in proportion with their fineness and fluidity. Fresh-killed meat is more readily impregnated, and stands in order of susceptibility as follows : pork, veal, rabbit, poultry, beef, mutton, horse. The effect also varies considerably according to the quality of the tobacco. All these experiments would seem to denote that great care should be taken not to allow smoking where foods, especially moist foods, such as meats, fats, and certain fruits, are exposed.

TRANSACTIONS OF THE SEVENTH ANNUAL
MEETING OF THE AMERICAN CLIMATOLOGI-
CAL ASSOCIATION, HELD AT DENVER, COL.,
SEPTEMBER, 1890. (Continued from page 241.)

RELATIONS OF CERTAIN METEOROLOGICAL CON-
DITIONS TO DISEASES OF THE LUNGS AND
AIR-PASSAGES IN COLORADO.

By HENRY B. BAKER, A.M., M.D., Lansing, Mich.

IT is probably known to most of the members of this Association that in preceding papers, before this Association and elsewhere, I have presented extensive statistics of sickness and of mortality which proved conclusively, to my mind, that certain meteorological conditions are related closely and casually to all the important ordinary diseases of the lungs and air-passages in certain parts of the world—in Michigan, in Massachusetts, in London, England, in India, etc. The evidence is of such a character as to lead me to think that similar causal relations prevail throughout the world. But this has not yet been demonstrated. The purpose of this paper is to extend the evidence on this subject by the presentation of facts bearing upon it, collected here in Colorado, and in a few other parts of the world, where the subject has not heretofore been studied in a scientific manner, or, at least, not conclusively.

It may seem presumptuous for me to attempt to do this for Colorado, when there are so many able physicians in Colorado who are especially interested in climatology and in diseases of the lungs and air-passages; but, after having waited some years for some one of these able men to collect and publish such facts, my interest and curiosity to know the facts have overcome my modesty, and I have recently made a vigorous effort to obtain and group the facts for study. A large number of physicians, health officers, and officers in charge of public institutions in Colorado were written to, blank forms were sent to them, and an effort was made to obtain, from them and from published records, statements of the month of death of all decedents in Colorado, from consumption and other

diseases of the lungs and air-passages. I have to thank D. C. Dudley, writing for John E. Ray, Superintendent of the Colorado School for the Deaf and the Blind, and Joseph A. Lamping, Warden of Colorado State Penitentiary, for prompt responses to my requests; also Charles Ambrook, M.D., of Boulder, and T. G. Horn, M.D., of Colorado Springs, for valuable statistics of deaths in Colorado. I am indebted to the Health Commissioner of Denver for a statement of the deaths from consumption during each month of the year 1889; also to the United States Census of 1870 for a statement of the deaths from consumption in Colorado during each month of the census year 1870. I regret that the United States Census for 1880 does not state such facts relative to Colorado, or any city in Colorado. I am indebted to Sergeant Gilligen, of the United States Signal Service, now stationed in Denver, for data relative to wind and rainfall.

The statistics of deaths in Colorado from diseases of the lungs and air-passages other than consumption are so meagre that I have not been able to learn much from them. The statistics of deaths from consumption which I have collected and now present to you are not as numerous as wished, but they are valuable and quite worthy of study. It is to be hoped, however, that the public-spirited physicians in Colorado will see to it that such important facts as those relating to vital statistics in Colorado will not be so much neglected as they have been heretofore. People all over the world look to Colorado for such facts. It is gratifying to note that the city of Denver now publishes a monthly statement of the causes of deaths in Denver.

In order best to study the statistics of consumption in Colorado, and the relations of consumption to atmospheric conditions, I have put the evidence in tables, and in graphic diagrams accurately drawn to scale and correctly representing the facts in the tables. Tables 1, 2, and 3, and Diagrams 1, 2, and 3 exhibit the deaths from consumption in Colorado by months; and, by months, the relation which the consumption mortality sustains to the atmospheric temperature, the absolute humidity, and the relative humidity.

It requires only a glance at Diagram No. 1 to prove that in Colorado, as in all other parts of the world thus far studied,

CONSUMPTION AND TEMPERATURE IN COLORADO.

TABLE I.—Exhibiting by months (each made 30 days) for the years 1870 and 1875-89, the average number of deaths from consumption* in Colorado, also the average atmospheric temperature† for the 16 years, 1872-87, in Denver, Colorado.

YEARS AND MONTHS.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Average number of deaths from Consumption* in Colorado by months (each made 30 days) 1870 and 1875-89,	44.52	41.33	35.81	41.00	40.65	29.00	25.16	32.00	31.00	39.68	42.00	41.61
Average number of Deaths from Consumption in Colorado (months unequal), 1870 and 1875-89,	46	39	37	41	42	29	26	34	31	41	42	43
Average number of Deaths from Consumption in Colorado Springs, 1875-89 (months unequal),	10	4	7	6	10	8	3	4	10	6	6	4
Average number of Deaths from Consumption, Boulder, 1881-89 (months unequal),	4	3	3	1	3	2	2	4	3	1	0	3
Number of Deaths from Consumption in Denver, 1889 (months unequal),	28	31	20	32	28	14	18	25	17	34	34	31
Number of Deaths from Consumption in Colorado, in 1870, U. S. Census, 1870 (months unequal),	4	1	7	2	1	5	3	1	1	0	2	5
Average Atmospheric Temperature ^t in Colorado, 16 years, 1872-87,	27.3	32.2	37.9	46.5	57.2	67.2	72.4	70.4	61.3	50.1	37.6	30.5

* Deaths from consumption in Colorado during the census year 1870, in Denver during 1889, in Colorado Springs and in Boulder for a long series of years.

† From reports of the Chief Signal Officer, United States.

NOTE.—The first and seventh lines in Table I are graphically represented in Diagram I.

CONSUMPTION AND ABSOLUTE HUMIDITY IN COLORADO.

TABLE 2.—Exhibiting by months (each made 30 days), for a series of years, the average number of deaths from consumption* in Colorado, also the average absolute humidity† (grains of vapor in a cubic foot of air) for a series of years, in Denver, Colorado.

MONTHS.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Deaths from Consumption*	44.52	41.33	35.81	41.00	40.65	29.00	25.16	32.90	31.00	39.68	42.00	41.61
Average absolute humidity†	0.96	1.17	1.43	1.81	2.55	3.41	4.09	4.08	2.77	1.96	1.41	1.12

Note.—Table 2 is graphically represented in Diagram 2.

CONSUMPTION AND RELATIVE HUMIDITY IN COLORADO.

TABLE 3.—Exhibiting by months (each made 30 days) for a series of years, the average number of deaths from consumption* in Colorado, also the average relative humidity† of the atmosphere (per cent of saturation) at Denver, Colorado.

MONTHS.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Deaths from Consumption*	44.52	41.33	35.81	41.00	40.65	29.00	25.16	32.90	31.00	39.68	42.00	41.61
Average relative humidity†	55.0	54.9	49.9	50.1	49.1	47.4	48.4	50.7	46.5	48.3	53.1	56.3

* Deaths from consumption in Colorado during the census year 1870, in Denver during 1889, in Colorado Springs and in Boulder for a long series of years.

† From reports of the Chief Signal Officer, United States.

‡ Computed from average temperature and average relative humidity by Table X, page 1393, "Smithsonian Meteorological and Physical Tables," 1859.

Note.—Table 3 is graphically represented in Diagram 3.

CONSUMPTION AND TEMPERATURE IN THIRTY-ONE CITIES IN THE UNITED STATES.

TABLE 4.—Exhibiting by months (all made 30 days) the number of deaths from consumption* in 31 cities in the United States during the census year 1880, also the average atmospheric temperature† at six stations.

MONTHS.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Deaths from Consumption*	1691.61	1846.58	1897.74	1821.	1657.74	1420.	1486.45	1382.90	1529.	1587.10	1595.	1683.87
Average atmospheric temperature†	36	38	45	54	66	74	78	76	69	56	46	38

* From data in Vol. XII., Part II., page 61, Tenth Census Report, United States, 1880.

† From normals at six stations : Cincinnati, St. Louis, Memphis, Nashville, Fortress Monroe, and Philadelphia.

NOTE.—Table 4 is graphically represented in Diagram 4.

TABLE 5.—Exhibiting by months the average daily velocity of the wind* for a period of 16 years, 1872-87, at Denver, Colorado; also the monthly average rainfall† for the same period of time at the same place.

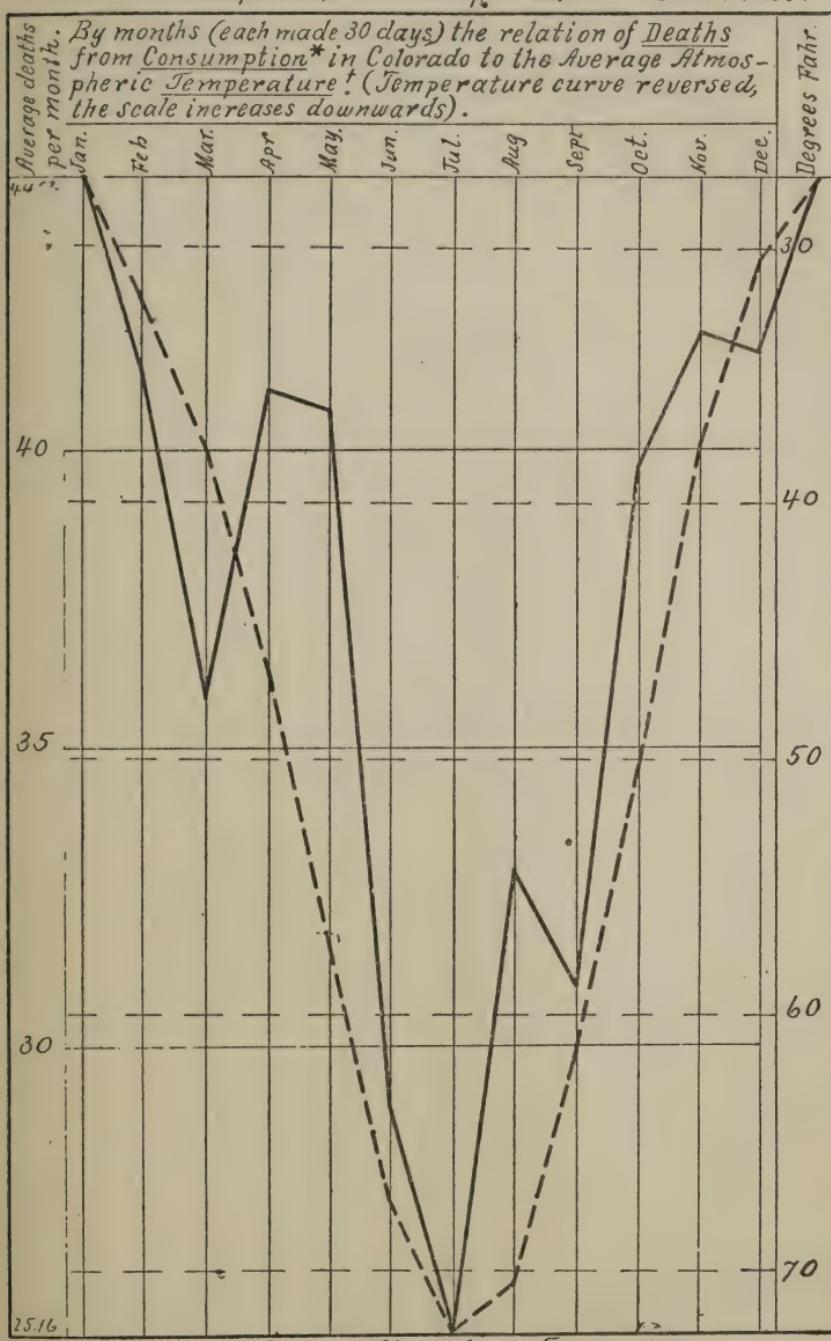
MONTHS.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Daily average velocity of the wind, 16 years, 1872-87, at Denver, Colorado*	165.8	160.9	178.0	180.2	165.5	159.4	150.6	139.2	138.1	147.7	154.7	151.6
Average monthly rainfall, for 16 years, 1872-87, at Denver, Colorado*	0.639	0.487	0.926	2.108	2.784	1.508	1.728	1.606	0.926	0.731	0.734	0.721
Deaths from Consumption†	44.52	41.33	35.81	41.	40.65	29.	25.16	32.90	31.	39.68	42.	41.61

* The data for velocity of the wind and rainfall were supplied by Sergeant J. J. Gilligan, United States Signal Service, Denver, Colorado.

† From data in Vol. XII., Part II., page 61, Tenth Census Report, United States, 1880.

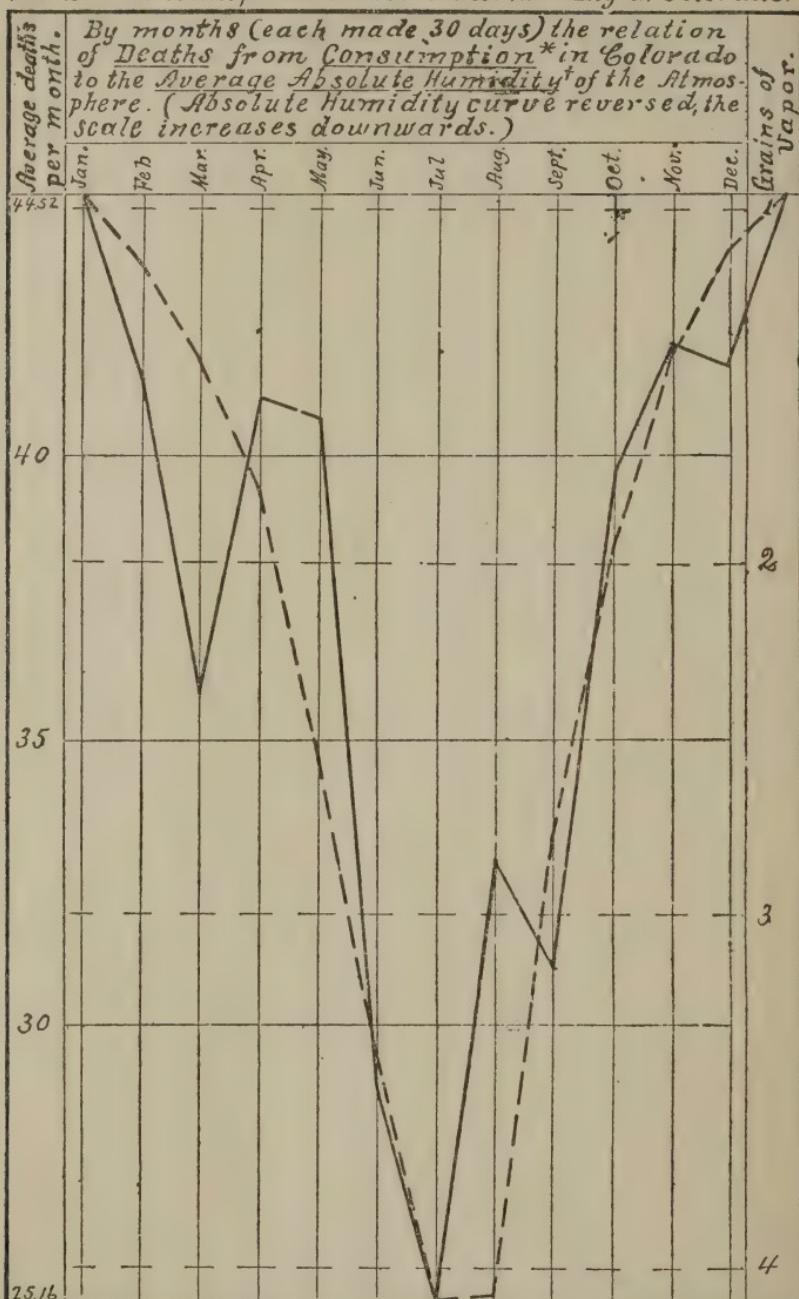
The lines, "average velocity of the wind" and "deaths from consumption", in Table 5 are graphically represented in Diagram 5.

No. 1.—Consumption, and Temperature in Colorado.



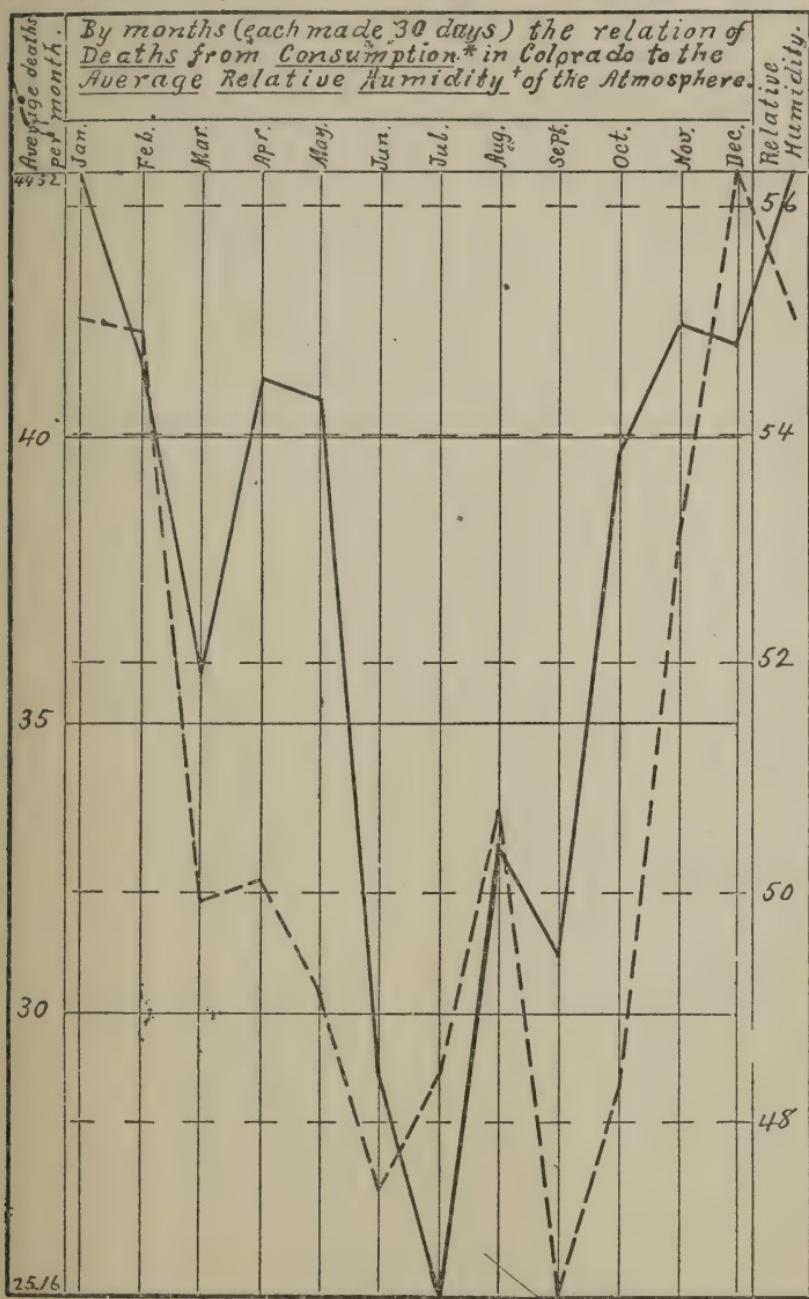
*The Temperature curve represents the Average for a period of 16 years, 1872-87. The data are from the Reports of the Chief Signal Officer, U.S. +The curve for Deaths from consumption represents the deaths occurring in Colorado during the census year 1870, in Denver during 1887, in Colorado Springs and in Boulder during a long series of years.

No. 2.—Consumption and Absolute Humidity in Colorado.



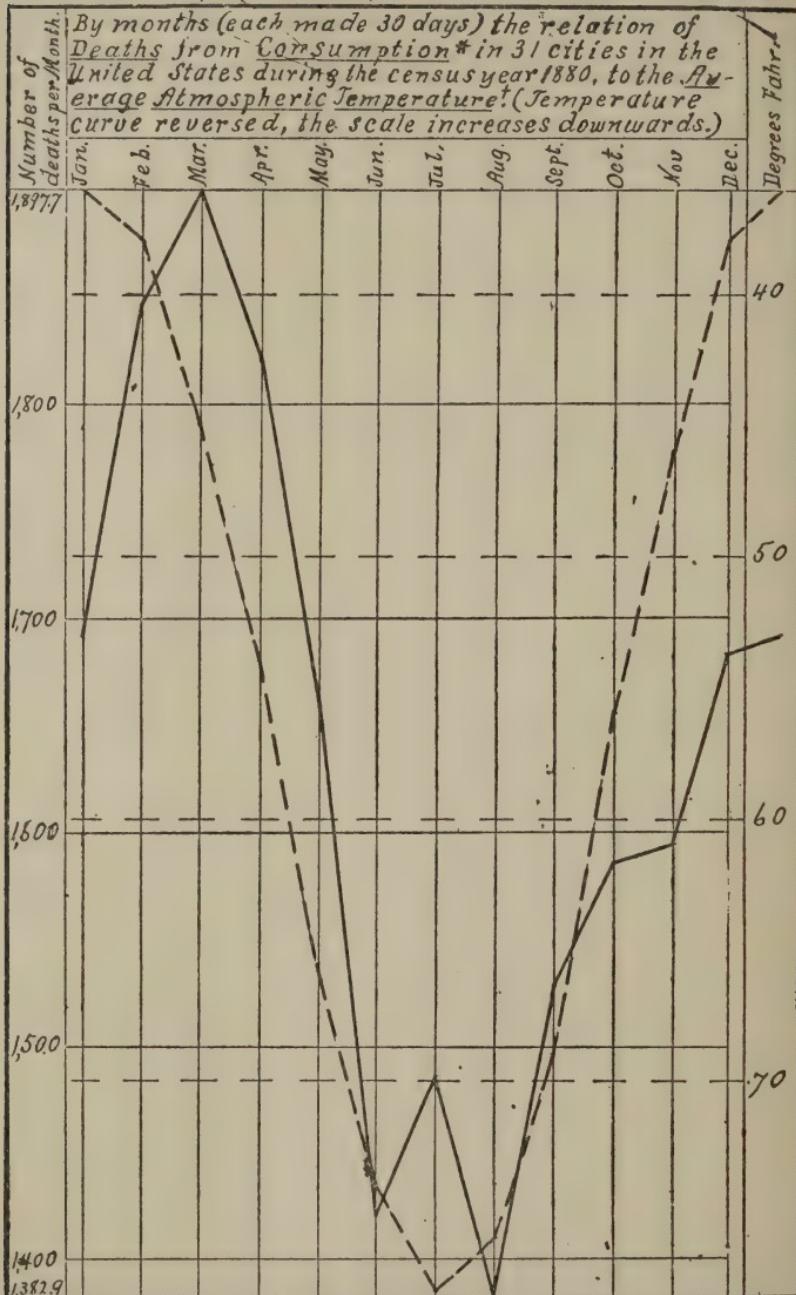
*Deaths ———, Average Absolute Humidity ——.
 The curve represents the deaths from consumption in Colorado during the census year 1880, in Denver during 1889, in Colorado Springs and in Boulder during a long series of years.
 t The absolute humidity was computed from monthly averages of temperature and relative humidity in Denver, Colorado, by Table X. Page B 93, "Smithsonian Meteorological and Physical Tables, 1859."

No. 3.—Consumption, and Relative Humidity in Colorado.



Deaths — Relative Humidity —
 *The curve represents the deaths from consumption in Colorado during the census year 1880, in Denver during 1889, in Colorado Springs and in Boulder during a long series of years. †The curve for relative humidity represents the average for a period of 10 years, 1878-87. The data is from the Reports of the Chief Signal Officer, U. S.

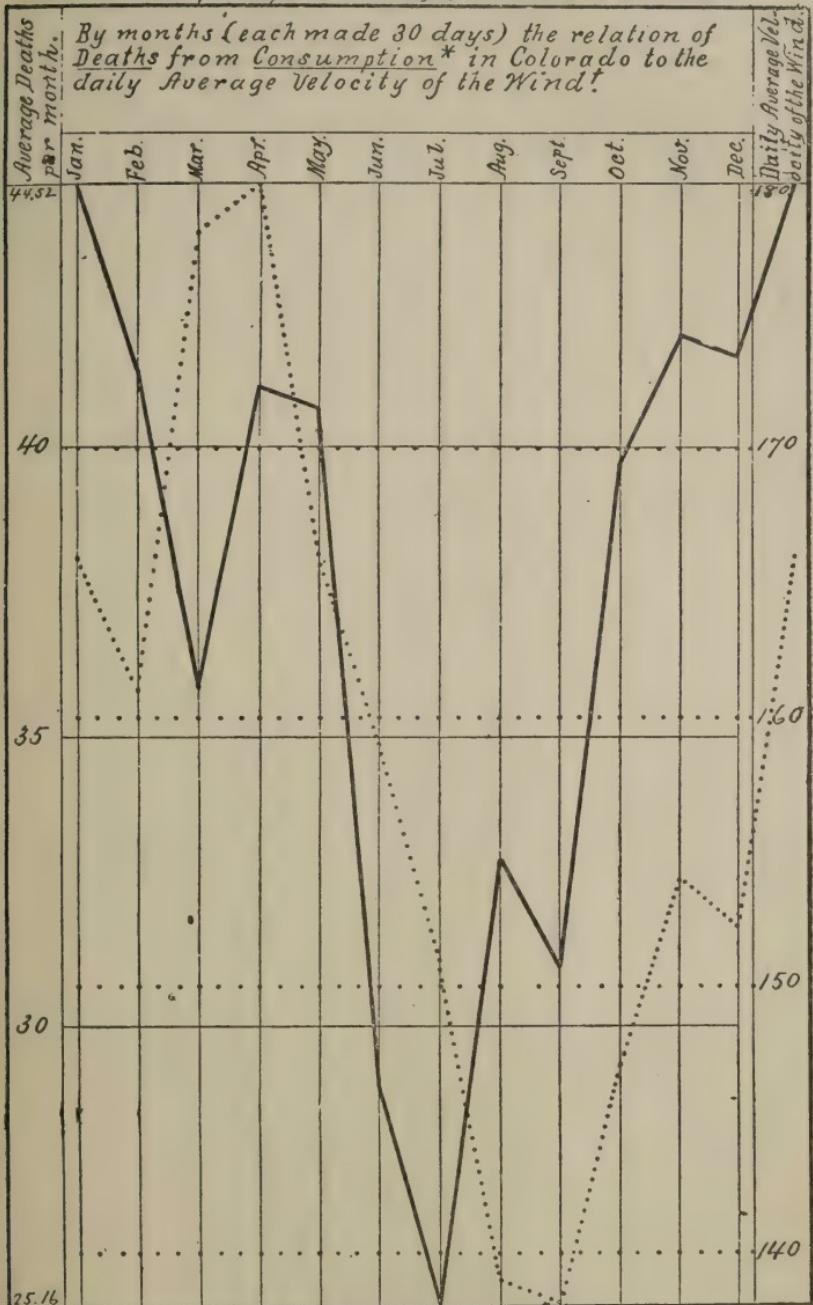
No. 4 - Consumption and Temperature in 31 Cities in the U.S.



Deaths — Average Atmospheric Temperature —
 * The curve for deaths from consumption is made from data in Vol.-XII., Part II. page lxi, Tenth Census Report, U.S. 1880.

† The temperature curve is made from the normals at six stations: Cincinnati, St. Louis, Memphis, Nashville, Fortress Monroe, and Philadelphia.

No. 5.—Consumption, and Velocity of the Wind in Colorado.

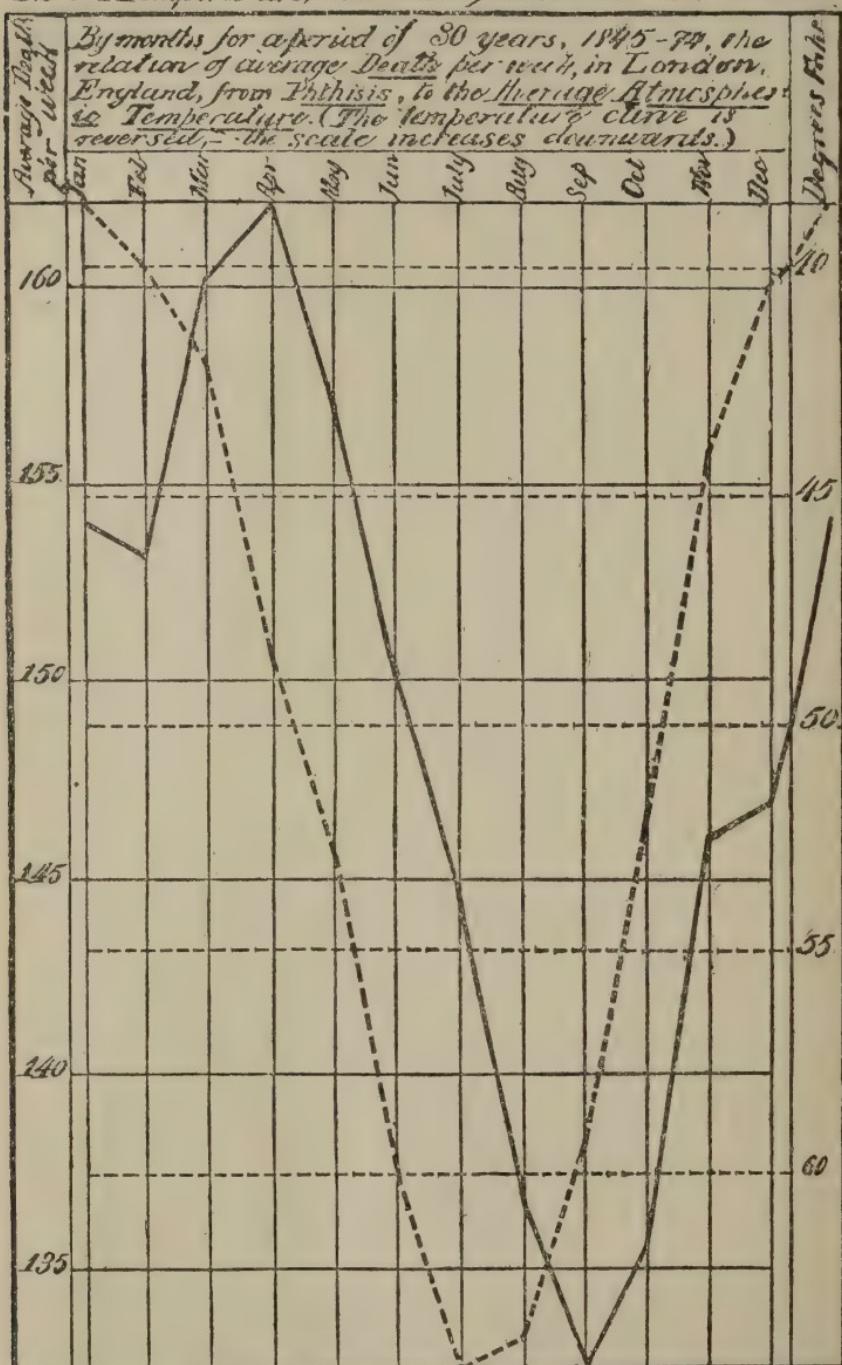


Deaths Velocity of the Wind

*The curve for consumption represents the deaths occurring in Colorado during the census year 1870, in Denver during 1889, in Colorado Springs and in Boulder for a long series of years.

†The curve for velocity of the wind represents the daily average for 16 years, 1872-87, at Denver, Colorado. The data was supplied by Sergt J. J. Gilligan, U.S. Signal Service Denver, Colorado.

No 6.—Temperature, and Deaths from Phthisis in London.



Deaths — Average Temperature —
 About 291,000 deaths from Phthisis are represented in
 this diagram, data for which are from *Journal of Scottish Met.
 Soc.*, New Series Nos. XIII, XIV, XV, XVI, pages 252 and 263.

No. 7 Temperature and Sickness from Consumption in Michigan.

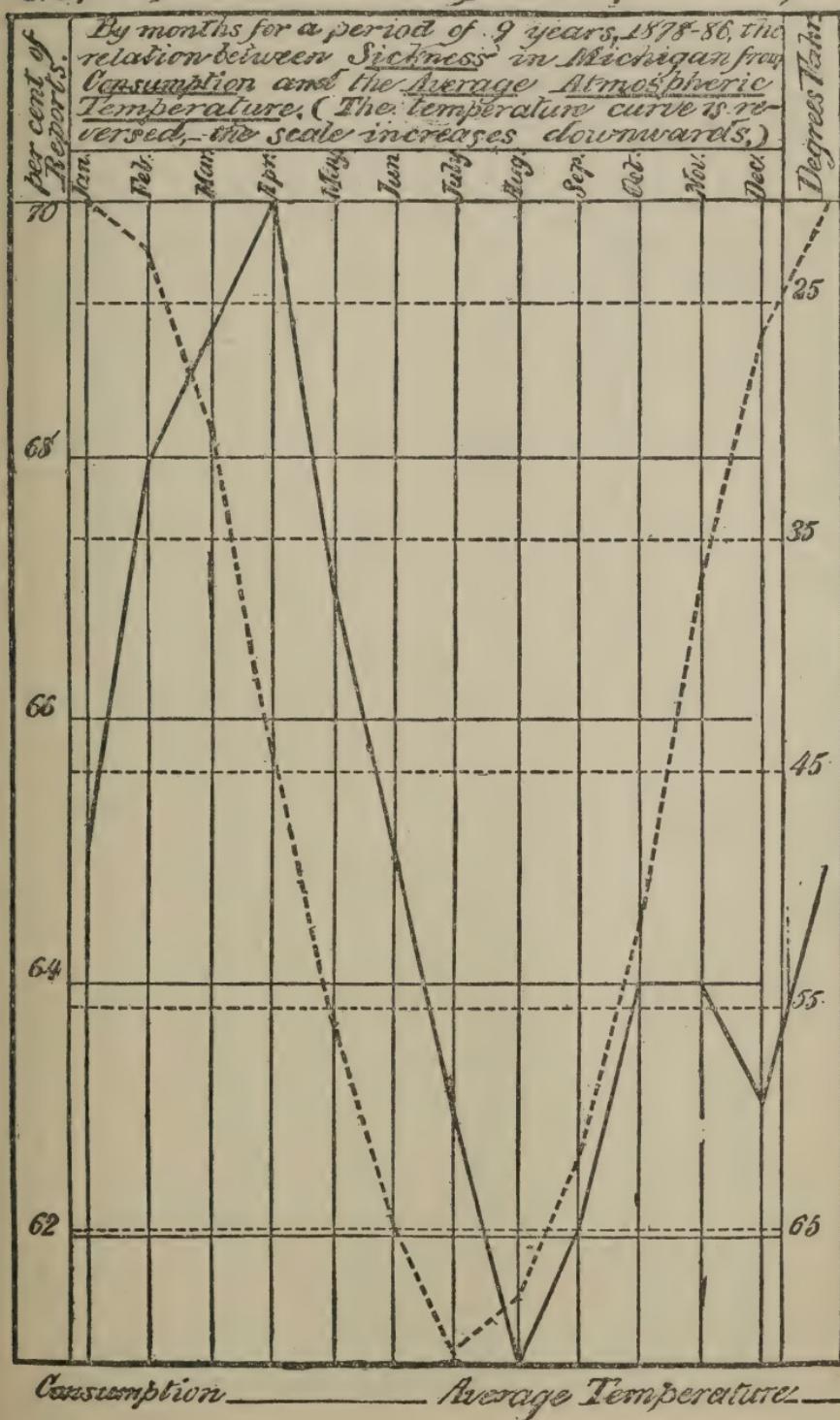
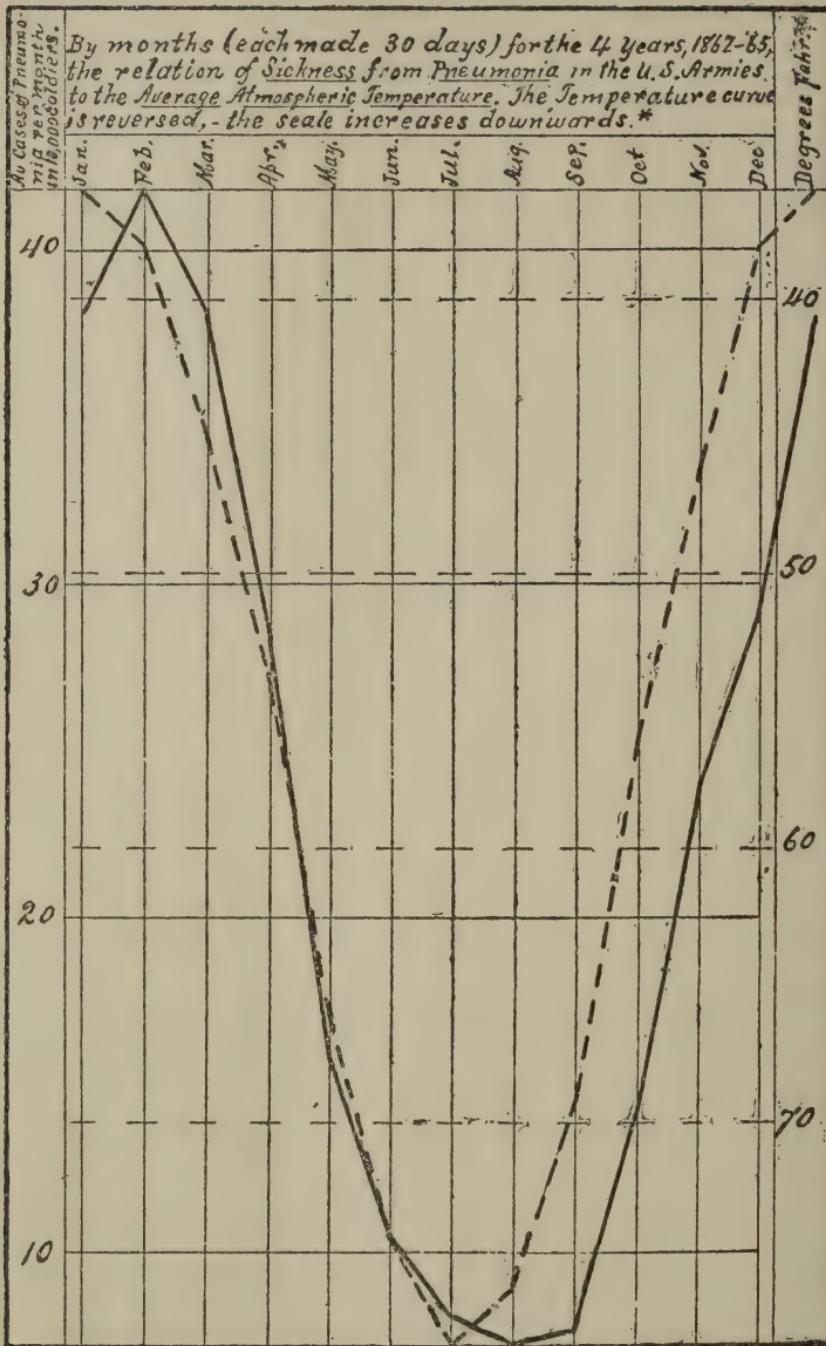


Diagram 8. Temperature and Sickness from Pneumonia in U.S. Armies.



Pneumonia. — Average Temperature. —
The temperature curve is made from the normals at six stations representing approximately the localities occupied by the armies of the United States, during the war of the rebellion.

the mortality from consumption is much influenced, directly or indirectly, by the temperature of the atmosphere. There is such a general correspondence of the two curves (for consumption and atmospheric temperature) as to indicate some necessary relation between them. In fact the mortality follows the temperature curve with a less interval of time than is found to be the case in Michigan, in Massachusetts, in London, or in the United States Army. So far as relates to Michigan and London, this is shown by studying Diagram 1 in comparison with Diagrams 6 and 7. This seems to prove that in Colorado the deaths from consumption follow the fall in the temperature at least a month sooner than they do in any other part of the world which I have studied. We may well study further concerning this fact, in order to learn, if possible, the reason why this is so :

It will be seen by Diagram No. 1, relative to consumption in Colorado, that there are least deaths in the warmest month and most deaths in the coldest month, while in all the diagrams except those for Colorado, the curve for consumption, whether it represents sickness or deaths, follows *after* the curve representing the atmospheric temperature, there being usually one or two months between the temperature changes and the corresponding changes in the consumption. The same is usually true concerning small-pox, although in Diagram No. 4 there are exceptions to this. As regards small-pox (contracted because of the sore throat due to exposure to cold), it seems that to a person exposed to the inhalation of cold air it is usually a month or more before the small-pox proves fatal. The period of incubation being about half a month, the remaining half month or more represents the length of the fatal illness, and the time which elapsed between the exposure to the cold air and the contraction of the disease.* In have found that the changes in the *sickness* from consumption in Michigan and in the United States armies, follow about the same length of time later than the temperature changes, as do the changes in the deaths from small-pox

* In London, England, the changes in the deaths from small-pox follow at least two months later than the changes in the atmospheric temperature. There are nearly twice as many deaths from small-pox following the cold weather as there are following the warm weather.

—that is, one or two months later. I think the explanation probably is that consumption of the lungs is most frequently contracted in the same way that small-pox is—that is, by the specific cause being inhaled. Also that to persons having tubercular infection in some other part of the body, consumption of the lungs may occur through exudations brought about by exposure to the inhalation of cold air.

If these are the true explanations, then not only should the sickness from consumption follow the exposure, as it does, after about the same interval of time as does the small-pox sickness, but a portion of the *deaths* from consumption of the lungs should follow, as is the case, after about the same interval, because the exudations and the consumptive processes are increased by exposure to cold air. That all the inflammatory and exudative diseases of the throat and air-passages are increased by exposure to cold atmosphere, in Michigan and in every country in which the subject has been systematically studied, there can be no question. That the average deaths from consumption follow more quickly after the atmospheric changes in Colorado than they do in the other States and countries may, I think, be due to the assumed fact (I suppose it to be a fact) that the consumptive inhabitants of Colorado are, as a rule, nearer death than are the consumptive inhabitants in the other States and countries studied, that being the reason why they left the Northern and Eastern States to seek restoration to health in this favored region.

There is, however, another item of evidence in the same direction; the difference between the mortality during the warmest month and that during the coldest month is greater in Colorado than in Michigan, Massachusetts, or London, England. It is even greater than it was in the United States armies during the war of 1861–65, where the mortality in March was 62 per cent greater than it was during September, while in Colorado the mortality in January is about 77 per cent greater than it is during July. Taking the statistics as they are, it thus appears that not only do consumptives die *more quickly* on exposure to cold in Colorado than in other States and countries, but a much *larger proportion of them die* on exposure to cold, or if not that then Colorado is proportionately more favorable to consumptives in summer.

However, although I have been told by a few physicians and other residents who claimed to know, that consumptives come to Colorado at all seasons of the year in about equal proportions, yet from the best evidence I can obtain I am inclined to think that a few more come in winter than in summer, and that more leave Colorado in summer than in winter, and that a part of the greater number of deaths from consumption in Colorado during the winter is due to those movements of consumptives.

And the reverse of the foregoing is undoubtedly true of Michigan, of Massachusetts, and of London, England, as is distinctly indicated for the first and last-named places, I think, by the Diagrams Nos. 6 and 7, in which it may be seen that the curve representing the sickness (or the deaths) from consumption is so low from November to February as to be unaccountable by almost any supposition except that many consumptives left those parts of the world during the cold months. I think that, as a rule, they go to warmer climates, but I believe that some of them go to Colorado.

With the view of learning more, if possible, about these movements of consumptives, and the influence they have on the mortality and morbility statistics, I have studied the combined statistics of deaths from consumption in Northern and Southern cities, by means of a graphic diagram made from data in the United States Census of 1880. This diagram is No. 4 of the series made to illustrate this paper. From that diagram it may be seen, however, that there are still such depressions in the curve representing the winter months as to indicate that not so many consumptives are present in those cities, on the average, in the winter months as in the summer months. The reason for this is, perhaps, because the list includes more large cities in the Northern than in the Southern states.

CONSUMPTION, AND HUMIDITY OF THE ATMOSPHERE.

By reference to Diagram No. 2 it will be seen that the relation of consumption to absolute humidity in Colorado is quite close, as it has been found to be wherever the subject has been studied, the *most* mortality from consumption occurring in Colorado when there is the *least* vapor of water in the atmos-

phere, and the *least* mortality when there is *most* vapor of water in the atmosphere. The relation thus being inverse, the curve in Diagram No. 2 representing the absolute humidity, is reversed in order to facilitate the comparison. The comparison shows that there is a quantitative relation between absolute humidity of the atmosphere and mortality from consumption in Colorado.

Diagram No. 2 also exhibits the fact that there are a few very noticeable exceptions to the general rule of quantitative relation between absolute humidity and consumption in Colorado. And it is a fact worthy of especial study that the most of these exceptions seem to find explanation in Diagram No. 3, exhibiting the *relative* humidity and its relations to the mortality from consumption. Diagram No. 3 exhibits the fact that in Colorado there is—what I have not found to be true in any other State or country—a well-marked relation between the relative humidity and the mortality from consumption, there being noticeably *more* mortality in months when the atmosphere was *more* than usually saturated with vapor of water, and *less* mortality in months when the atmosphere was *less* than usually saturated. In Diagram No. 3, therefore, neither of the curves are reversed.

A comparison of Diagrams 1, 2, and 3 shows that in Colorado the relation of consumption to relative humidity is not so close and quantitative as is the relation of consumption to the atmospheric temperature and to absolute humidity, yet it shows that nearly all the departures from quantitative relations of temperature to consumption are in just those months when they are accounted for by the changes in the relative humidity—that is, if we accept the prevalent belief in the unfavorable influence of great relative humidity. The evidence in these several diagrams—1, 2, and 3—is in complete harmony with what I wrote on this subject some years ago when studying the subject for Michigan, and which I cannot now state in much clearer language: "Theoretically, it would appear that great relative humidity may be directly injurious to human tissues in cold weather by reason of the increased abstraction of heat from the body and particularly from the air-passages, because of the much greater specific heat of water than of air—the body parting with its heat by conduction so

much more readily to moist than to relatively dry air. The circulation of the blood through the lungs may be interfered with by such abnormal abstraction of heat while exposed to out-door air, and by the reaction consequent upon a return from such cold moist atmosphere to a heated room. Congestion of the lungs may perhaps be thus induced.”*

For ages there has been a widespread belief that exposure to cold air that was moist, relatively, was injurious to persons liable to lung disease. Theoretically it was injurious, as I have just stated. We now have, in these tables and diagrams, evidence which is, to a certain extent, exact and quantitative, and is therefore available for study in a scientific manner.

It seems that, in Colorado, at least, relative humidity does modify the controlling influence which the fall and rise of atmospheric temperature has over the rise and fall of mortality from consumption; a fall of about five per cent in the relative humidity, when the atmospheric temperature is about 60° F., causing a decrease in the mortality of about five-thirty-sixths—about one-seventh. Approximately this seems to be indicated by a study of the curves in Diagrams 1 and 3 for the month of September, estimating what the mortality might have been in September, if midway between what it was for August and October. Again, the diagrams show that in March a fall of relative humidity (of about three per cent) is associated with a fall in the death-rate from consumption equal to about five-fortieths—one-eighth of the whole.

Of course I am speaking only from the evidence which I have been able to collect. I regret that the statistics of mortality in Colorado are so meagre. And it is especially to be regretted that we have not for Colorado, as we have for Michigan, statistics of the *sickness* from all the important diseases. What information is of more value than that which relates to life and death—that which should enable us to know just what conditions tend toward continued normal life, and what conditions tend toward deaths “as the fool dieth”? For truly, now, as in the days of Hosea (4 : 6), our “people are destroyed for lack of knowledge.”

* “Causation of Pneumonia,” Report Michigan Board of Health, 1886, p. 284.

CLINICAL EXPERIENCE.

In this connection, however, I wish to try to correct one prevalent error. We have some knowledge which is positive and useful, and when discredit is attached to it progress is retarded. It is a common thing to discredit statistics. People seem to forget that statistics consist of numerous facts, and that the greater the number of facts of a kind that are brought together, the greater is the probability of the truth of the average statements of them, because errors of statement tend to balance and negative each other, and the general fact thus becomes constantly modified toward the exact truth. When one is tempted to declare that conclusions based upon these statistics of consumption are "groundless," because they do not coincide with what he believes is the "general clinical experience,"* he should reflect that these statistics are the "general clinical experience." The facts I have used relative to consumption in Colorado include those from the clinical experience of such good men as Dr. Ambrook of Boulder, of Dr. Horn, of Colorado Springs—and they would have included the results of the clinical experience of other prominent physicians in Colorado if they had responded to my request by giving such facts. To be sure we have for Colorado only the facts respecting the *deaths* from consumption, but for the State of Michigan we have the records of the *sickness* according to the "clinical experience" of the leading physicians of the State, because we have, for many years, their weekly reports of sickness under their immediate observation. That is the basis for the curve in Diagram No. 7, representing sickness from consumption and its relation to the atmospheric temperature. The "clinical experience" of nearly all of our army surgeons during the last great war is represented by the curve for deaths from consumption in a diagram published in the *Journal of the American Medical Association*, January 18th, 1890, and which is almost identical to the curve in Diagram No. 4, which I now present, and which represents the deaths from consumption in thirty-one cities in the United States. In Diagram No. 8 is a curve correctly representing sickness from pneumonia according to the combined "clinical

* *Journal of the American Medical Association*, 1890.

experience" of all of our army surgeons during the last great war. It proves conclusively that sickness from pneumonia was quantitatively related to atmospheric temperature.

One point I wish to make in this connection is that "clinical experience" is generally valuable in proportion as conclusions from it can be based, not on one experience, which may be exceptional, nor on a few experiences, which still may not teach the exact truth, but upon large numbers of experiences properly classified, arranged, and consolidated into what we call statistics.

On this same principle the vital statistics of Colorado should be studied in connection with the statistics in other States and countries. The statistics of consumption should be studied in connection with the statistics of other diseases. It seems to me that a careful study of the subject of this paper, in this manner, taking into account work done heretofore, leads to the general conclusion expressed at its beginning, "that certain meteorological conditions are related closely and casually to all the important ordinary diseases of the lungs and air-passages," and to all communicable diseases like consumption, small-pox, etc., which usually enter the body by way of the air-passages ; the evidence is still "of such a character as to lead me to think that similar causal relations prevail throughout the world."

In Colorado, as in other parts of the world, deaths from consumption result from being in an atmosphere that is cold and dry, absolutely. In Colorado, at least, the *saturation* of the air with vapor of water apparently increases, and the reverse of this process decreases the unfavorable effects of a cold atmosphere, toward the causation of deaths from consumption. In Colorado, as elsewhere, the danger from consumption is much greater in winter than in summer ; that is to say, it is greater in cold weather than in warm weather. My own belief is that this will probably be found to be a universal law. If so, it has an important bearing upon human life and health.

It is of such great importance that this law, if it is a law, shall be established on a firm scientific basis that, in this paper, I refrain from complicating the study of it with any question whether the relations of these meteorological condi-

tions to diseases of the lungs and air-passages are direct or indirect.

I do not claim that this is a newly-discovered law. I have known it for several years. Apparently it was well known to Hippocrates,* so far as relates to temperature and relative humidity, although, in his day, he could not have had any accurate thought of absolute atmospheric humidity, and he must have assumed, as many who are ignorant of the subject now do, that the relative or *apparent* humidity coincides with the absolute humidity which, generally, is the reverse of the truth, as is shown by the tables and diagrams which I present herewith. But no natural law is of use to mankind until it is established, accepted, and acted upon. My sincere hope is that members of this Association will devote sufficient attention to this subject to settle the question definitely and for all time ; because it is not only a primary question, it is a fundamental question in biological climatology, and without the settlement of such questions there can be no science of clima-totherapy nor of sanitary climatology.

* Set forth in his book on "Airs, Waters, and Places," namely, that cold and damp weather produces diseases of the respiratory organs. John S. Billings, M.D., "Introduction to Buck's Hygiene," Vol. I. p. 34.

DISCUSSION.

Dr. Ingalls: Mr. President, I have been exceedingly interested in this; and I have very little to say, except that I want to call the attention of the Association to something that the doctor merely glanced at in going over. As we came on from Chicago the doctor was speaking to me of his charts, and this wind-line was not in any of his charts, and he did not know anything about it then. He pointed out the relation of the death-rate and the temperature to me; but he says, "There is a point, and there is a point, and there is a point; I don't know what is the matter. I don't know what causes that; and I am going to see if I can find out anything more."

It seems to me exceedingly interesting that the wind-line seems to account for this irregularity in his death-rate, that he was not able to account for in any other way. It precedes the death-rate by about a month in all cases, this preceding that about a month, this preceding that about a month, and this one precedes that.

Dr. Denison: (Referring to sketch on the blackboard. Diagram No. 5, page 315.) Does the down-stroke of the dotted line correspond with the up-stroke of the other in time?

Dr. Baker: No. The reverse of that, as a rule, as stated by Dr. Ingalls, who stated it correctly. Under November, this point here, in the dotted line representing the wind (Diagram No. 5, page 315), coincides with the solid line representing consumption—both lines rising to November and falling to December. This rise in the wind in March, however, precedes the rise in consumption just one month. The rise of the wind in March and April seems to have causal relation to the rise of consumption in April and May, and no other meteorological condition studied has such relation to the extent of controlling the disease. In September and in December the fall of the curve representing the wind is coincident with the fall of the one representing the mortality from consumption, and the fall or decrease in the wind is such, quantitatively, as would be expected to have influenced the decrease in the consumption. And, although the fall in the

relative humidity may have had influence in September, no meteorological condition studied, other than the wind, accounts for the decrease in consumption in December.

I think this Diagram (No. 5, page 315) when taken in connection with the others (Diagrams 1, 2, and 3) relating to Colorado, supplies, for the first time, conclusive evidence that the wind has causal relations to deaths from consumption.

Dr. Denison: I would like to say a few words about the paper, and partly to explain why I could not help the doctor, as he wrote to me about the statistics, more than I did. My practice is of such a kind that I have not pretended to keep any tabulated statistics of deaths, and I could not furnish the evidence that was wanted in any way that would be accurate. My only recourse was to see the Health Commissioner, and ask him to afford Dr. Baker every facility that his office could give him. The subject is certainly very interesting. I do not wish to decry or lessen the value of statistics, especially when they can be taken and studied on a broad basis. Nevertheless, it is so that we can prove almost anything by statistics. That is, there is a possibility to prove even a theory which is wrong, by statistics.

I gave a great deal of attention to gathering up the combined opinion of physicians at one time, and went to work and sent out as many as three thousand letters with certain questions to be answered, and I received seven hundred replies, some of which must have taken those physicians half a day to compile and answer, with reference to their practice; and yet Dr. Lusk, when he answered those questions, decried the idea, because he said the average was not the thing we wanted—that didn't give the truth; that he would give more for any one individual's opinion, after he had studied those statistics, than he would for the sum total or average of the medical profession.

Now that same idea refers somewhat to statistics. For instance, if we reason in one line, and it were possible to give as fair a reason in another, the reasoning on the first line, whatever it may be, is in so far vitiated by the second reasoning, which is opposed to it. Now, if I was to reason with regard to the effect of *cold* particularly, and that is one of the points raised, the question of the habits of life must necessa-

rily come in, as the doctor has mentioned, which may have quite as much to do, perhaps, as the effect of cold itself. The changes of temperature between the rooms we live in and the out-door air, that great contrast in temperature that comes with people coming to live in-doors as the cold weather of fall comes on, I claim is of greater influence than the cold itself ; the contrast between the hot houses we live in and the cold we go out into, the shock to the system which is every day met with, and which is particularly injurious to the very old and the very young. We see these effects in Colorado, particularly with reference to broncho-pneumonia and bronchitis in children in the winter season, and the deaths which occur among old people in cold weather.

The doctor's reason is in harmony with this result ; but can it not come quite as much, I ask, from the contrast in the temperature between in-door life and out-door life as any other way? Where the conditions, as in Colorado, are so favorable to living out-doors in summer, this solution of the question is favored by the records of the mortality statistics. Then again, the deaths from debilitating diseases must, of course, come at a certain period subsequent to the real causes of the same. Is it not quite possible that those deaths which occur in the autumn, the climax being in December, according to the record, were caused by the heat of summer? It is certainly true, and the record bears it out, that the average improvement of consumptives is as good in the winter as it is in the summer for those who are able to live an out-door life. Where they are housed, this very argument I have mentioned has a deleterious effect—that is, if they cannot go out at all, or very seldom, they are not living an out-door life, and the injurious effects become manifest, due to changes from hot rooms to cold, out-door air—and we know what heated apartments some of these consumptives will keep themselves in, hugging a stove and not going out-doors at all. I don't believe the human race was intended by God Almighty to occupy the kind of houses we live in, or to live in the way we do. There is something wrong, we are out of joint somewhere, that so large a proportion of the human race should be constantly dying of consumption, when no illustration of such a mortality can be found in any other branch of the animal kingdom.

Now, as to how the statistics might be influenced by the time consumptives come here. The very feeble cases are always housed over winter in the East, and come here in warm weather. There is a forlorn hope that they can pass another winter—and the hope is very forlorn sometimes—when they are in acute conditions, and with excavation, it may be, in both lungs. It must be that the exciting effect of the high altitude and the serious condition of their disease will culminate in the fall and cause an increased mortality.

I will not mention the influence of the diagram the doctor gave (No. 3) with reference to relative humidity, simply because it is so favorable to Colorado; but it seems to me it is somewhat in harmony with the wind diagram, showing that increased velocity of the wind, and the changes of temperature which that increase indicates, perhaps may have a causative influence with reference to the deaths from debilitating diseases, particularly consumption, afterward.

I feel as though these points (the sickness of very young children and old people in an exciting climate, with the lessened temperature, particularly the extremes of winter) have a modifying influence, and may possibly explain some of those points. I don't remember how many cases are included in the paper to make up the average in total, with reference, for instance, to the relative humidity chart.

Dr. Baker: It is stated in the table. The same number is used as to each one.

Dr. Denison: I want to make the proposition that perhaps the fall of temperature may indicate a disintegrating influence. The improvement which occurs in some, and the inability to stand the increase of cold in others, may be a disintegrating influence between those cases which will improve and those which will retrograde. The trial will have to be made, and if they stand the change and live an out-door life in cold weather, the improvement will be very great.

The case which Dr. Knight has seen to-day is a very good illustration of that, she having excavation in both sides. That woman came here quite a number of years ago, and she has weathered the winters and improved in winter; but this summer she has had a continuous fever and an increase in breaking-down. I think there was something of this ill effect last

summer, and for that reason I kept her out in the foot-hills, where the weather was cooler in the summer. It is possible that cold is a sort of levelling influence, showing what number of cases may improve and what number may retrograde as the cold of autumn or winter comes on.

Then, again, the facility for out-door exercise in the warm weather is another modifying influence, the feeble consumptive perhaps housing himself as the cold or fall comes on, and shutting the windows, and no longer sleeping with the windows open. There are a great many things that may influence this curve and explain the coincidence which Dr. Baker says would occur.

Dr. Solly : I didn't hear the whole of the paper ; but, as I understand it, the general conclusion is that the cold, dry air causes death from consumption—the number of deaths from consumption is increased when the weather is coldest and dryest.

Dr. Denison : The record of one of the charts shows that the deaths decrease with the dryness and increase with the relative humidity ; but the coldness was the other point.

Dr. Solly : To speak with reference to the coldness, I think Dr. Denison's suggestion is a very good one—that people don't die from the cold outside, but die from the heat inside, and then going into the cold outside. It is the condition in which they keep their houses, and I think that is very probable ; and then, as he suggests, it is the time of year in which they would drop off after the heat of summer. I think, in taking cases of consumption, as to the effect upon the disease—not death from consumption, but the effect on the disease—it is reasonable to suppose it is good for a patient who is tending to improve from consumption, and has the capacity to improve, and those who are on the decline, whose death is almost a moral certainty ; it is precipitated by the change between out-door air and the in-door air, and such extremes of temperature will brace up and do good to the invalid who has the ability to stand it and a tendency to improve, and will cause those to drop off who are on the decline. We know in old age how much better it is to keep a person on what they call an even keel, applied to the question of levelling things down to a certain grade, and keeping it down to that point.

I remember how much better they did in London, where the dangers are pretty well modified, and the conditions are pretty much the same, than in the country. Younger children do better in the country than in the city ; so in the disease ; in the declining stage of the disease, we can see how, when there are these shocks encountered from coming from the heated air of the house into the cold air outside, why it should precipitate the termination of the disease ; and that probably is the explanation of it.

I see by one of those charts that the greatest mortality is in January, and then it rises again, I think, in May ; it falls between the two periods.

Dr. Baker : This is April and May.

Dr. Solly : In speaking of this it is certainly a matter of suggestion and impression. The doctor has certain facts with which I am not sufficiently familiar to criticise. As to the question of the weather, there is sufficient data for him to go upon to justify those charts. I don't know from my experience, but my clinical experience, as it impresses me is, that those cases of consumption, even quite advanced ones, if they will remain out-of-doors most of the days and keep their houses down in temperature, will go along through the winter, and generally succumb in the spring. I should certainly think in my own practice most of the deaths from consumption have occurred in the spring, as it is more common in chronic diseases all over, that they go through the winter and decline in the spring usually. I have seen bad cases recover, if they stay out-of-doors all day during the winter ; but those who house themselves, it is very common for them to drop off suddenly—they can't stand the shock of the change.

Dr. Bowditch : An open silence on my part would not indicate a lack of interest in Dr. Baker's paper ; it would simply indicate a feeling of inability to discuss it.

Clinically speaking, in Boston, I would say, from the middle of December to the middle of February, when we are liable to have our coldest and driest weather, I never feel the anxiety for the consumptive patients that happen to be under my control, as I have in the latter part of the autumn or early spring, when we begin to have our hard rains and humid winds, which I think would agree with Dr. Solly's remarks.

Dr. Baker : Mr. President, having stated in my paper that I considered of so great importance the question of whether what I have presented is a universal law or not, that I did not enter upon the question whether the influence of temperature was direct or indirect ; yet I wish to say a word in response to the remarks of the President.

I think all of us would agree with him theoretically if we had no positive evidence ; but when we come to take the statistics that have been put before us here to-day, and when we consider those that have been published heretofore, the theoretical considerations do not seem to harmonize with the facts I hold in my hand and you have in the printed series, the Diagram referred to, relative to "Temperature and Sickness from Respiratory Diseases in India," and the temperature there ranges from 70° to 85° F. Now try to imagine a shock to the system from being in-doors and going out-doors there. It seems to me we cannot imagine it. And yet in India the curves representing the meteorological conditions are like those representing the sickness conditions, just as though the two curves had been put on the diagram with a pair of calipers—one follows the other immediately nearly all the way around. Take, again, the statistics in the United States Army ; there is a diagram here in this printed series numbered 8, showing that in the United States armies during the great war, the changes in the sickness from pneumonia followed immediately after the changes in the atmospheric temperature, among those soldiers, many of whom were outdoors in tents and in huts.

The facts as they occur in the statistics that have been set forth before, relative to persons living in-doors, and those living out-doors, all harmonize ; and here, too, you see the same thing is true in Colorado ; the changes in the sickness occur just in accordance with the evidence elsewhere—the exposure to wind, cold and dry air, is followed by sickness from the respiratory diseases and from consumption. That has a bearing, in my mind, as an answer to the question implied by Dr. Solly's remarks, and the President's, as to whether there were facts enough upon which to base a conclusion. The statistician, I think, judges of that also by the way the curves go ; where we have, as we have in most of these diagrams in

the printed series, the facts of one month—just exactly what you would expect them to be—from those relative to the preceding and following months, it tends greatly to strengthen the belief that we have the facts as they belong. Of course where there are fluctuations, as there are in that death curve—(deaths from consumption in Colorado)—then doubt is thrown upon it somewhat; but when those fluctuations are just in accordance with what we believe to be a general law (that is, if we believe the effect of low temperature is emphasized and made more impressive on the system by relatively saturated air), and the curve of relative humidity fits in with the other evidence, as it does relative to Colorado, then it tends to strengthen the belief that we have sufficient facts. Now the diagrams that I had constructed before I left home, with reference to the conditions here in Colorado, especially after having reviewed the conditions since I came here in connection with the evidence of the statistics of the wind, convince me that I have sufficient facts relative to Colorado to base conclusions upon.

Of course I should like to see more, but to me it is conclusive.

As to the exact number of deaths, I don't find it stated in the table, but before the paper is printed I will supply it. I see there are about 40 deaths per month; that would make 480 deaths—probably about 500 deaths only; but to me the evidence is quite conclusive that we have the facts before us.

SOME NOTES ON NEW MEXICO AND THE ADJACENT PLAINS.

By FRANCIS H. ATKINS, S.B., M.D., of Las Vegas, New Mexico.

IN offering this homely study of the climate of the dry Western plains, and especially the northern and eastern portion of New Mexico, I propose to bear so hard upon my own observations in the last seventeen years as to endanger eliciting comparison with Lord Erskine, whose parliamentary addresses were hopelessly beyond the printer's reproductive powers, as the stock of type representing the letter I invariably ran out during the composition of the first page or two.

My notes take their course by reason of a suggestion coming to me at a meeting of the Lodge of Odd Fellows at my home, Las Vegas, New Mexico, where a brother given to travel beyond the wont of most of us, while considering its finances, congratulated the Lodge one night on the infrequent drafts upon its treasury for sick benefits, adding that in his visits to Eastern lodges he was impressed by the many names of sick brothers called off each evening, while in our happy body weeks and months passed without a brother reported sick. My ready inferences as to the healthfulness of the town and speculations thereupon have led me to offer some odds and ends of evidence as to the salubrity of the region specified, to mention the diseases that have been rare or absent, to describe candidly some of our disadvantages, and to commend the climate in certain details.

As two of my friends from New Mexico are posted for papers on the relations of its climate to phthisis, to be read at this meeting, I will omit direct reference to that topic, especially as I wish to show that Coolidge's inferences from army records away back before the war, the first scientific deductions as to the advantages for consumptives in this region, and the much elaboration of the same since, do not mark the limitations of the arid parts as to the absence of disease or in its prevention.

Coming on the plains as medical officer to a military post seventeen years ago, so placed that the nearest physician to me in any direction was 115 miles, the next 130, and the third 225 (in Denver), it chanced my finger touched whatever public pulse there was in those days and parts. Six and a half years' practice on the plains, presently more thickly settled, at elevations of 2000 to 3500 feet, and ten and one-half years at altitudes above 6000 feet in denser settlements of New Mexico, afford the basis of these remarks.

In spite of small figures, usually thought to vitiate statistics, much can be learned from the study of sparsely settled regions or small municipalities; so, hoping my matter will not prove wholly trite, I make bold to offer so scientific a body these humble details.

Let me first mention a few diseases, absence or rarity of which renders fortunate these arid plains and plateaus. The absence of idiopathic acute pleurisy with effusion has been most striking, but one case originating here having fallen under my notice—that of a young man, cook in a large hotel—nor has it seemed to occur as a complication in other diseases. Twenty-one physicians averaging, perhaps, eight years each in New Mexico, whose experience I solicited, report fewer than two dozen cases as the result of their joint observations. The same considerable experience reports eight cases of empyema—of which I saw none—including four instances of thoracentesis.

Inflammation of the meninges of brain and spinal cord, except of tubercular etiology, must be vastly rare. I have seen none.

Hay asthma, common enough elsewhere to provoke hegiras and promote golden harvests at certain immune resorts, has been exceedingly rare. I have treated no case, nor heard of but one or two, though occasionally a marvellous cure by this climate is observed. My correspondents report fewer than a dozen cases, themselves twice the victims.

Judging solely by my own contact, I should rate acute articular rheumatism as formerly seen by me in the Mississippi Valley and the Atlantic States, and as depicted in books, an extremely rare disease. My observation of it has been limited to one well-marked case in Western Kansas twelve years ago,

shown me by a friend, and that had originated farther East ; and one very slight case—a single joint moderately swollen, in a young woman of Las Vegas, was actually my only case originating in the dry country ; but I have treated three youths of 10 to 20 years for valvular cardiac lesions where mild attacks of articular rheumatism had preceded. My correspondents, however, risk the trustworthiness of my notes by reporting such figures as 15, 20, 25, and even 50 cases (the last among miners at great altitudes). I would respectfully state, however, that to a certain extent I doubt the diagnosis of some of my friends. The disease is surely uncommon in Las Vegas, its joint-wrenching tortures being almost never heard of ; and some of the cases I have investigated proved to be genuine gout. Moreover, as a correspondent of age and long experience writes me, he has seen "not a single case, but no end of muscular and other forms ;" and right here, between the articular manifestations of gout and the pains of gonorrhœal and syphilitic rheumatism and the myalgia so common in New Mexico from the prevalent lithæmia, lies the error in diagnosis, I suspect, which emboldens me still to assert that here, as compared with moist Central and Eastern climates, typical acute articular rheumatism is a rather rare disease.

Diabetes mellitus I have happily never met nor heard of about me, save in one case, now in a friend's care at Las Vegas, in the person of one reckless in drink. Of diabetes insipidus I have seen three strongly marked cases, perhaps idiosyncratic in its causes rather than climatic unless as an erythritic outburst.

Non-tubercular diarrhoea among adults has been infrequent ; dysentery exceedingly rare, and the abdominal disorders of childhood markedly uncommon and mild ; in my walk, but one death in seventeen years in an ill-cared-for infant, whom I saw but once.

That typhoid-fever assumes a milder form on the mountain flanks, my medical friends in Las Vegas and elsewhere join me in believing most cases varying decidedly from the classical type in having a cleaner, moister tongue, and more rarely much diarrhoea, tympanites, or delirium, and in being less fatal.

Most significant has been the entire absence of chronic

Bright's disease. To point its infrequency, notice its prevalence elsewhere.

Delafield says, in Pepper's System, concerning chronic diffuse nephritis: "In New York it is of very common occurrence," and the death record of that city marks the loss of life from this affection as resting chiefly on males between 30 and 60 years, and on females between 20 and 55, thus depleting the population in the years of prime usefulness. Recent statistics show an apparent steady increase of it in Massachusetts, rising from 10.5 per 1000 deaths in 1870, through 19.7 in 1880 to 30.5 per 1000 deaths in 1886.

In the Boston City Hospital in one year 1 in 36 of all medical cases was Bright's disease, and it caused 9 per cent of all deaths on the medical side; 10 per cent in another year.

Even of the selected class of men whose deaths to the number of 2000 in the whole United States are reported by a good life insurance company, so large a percentage as 5 to 6 died by this affection.

In one instance last winter, in the person of a Mexican about 30 years old, I had reason to suspect chronic renal degeneration. After a year of steady failure of vital forces without specific symptoms, a single thorough investigation failed to suggest a cause until examination of the urine revealed a little albumen, with a few hyaline and granular casts; specific gravity 1020. In three weeks he died without any of the characteristic explosions of Bright's disease; but, being 30 miles distant, an autopsy was impossible. This was the only instance under my notice, even suggesting this disease originating in the dry region.

We often discover such degenerations among our visiting consumptives, however, though I have suspected no death from the complication. My correspondents, again, report several cases among Americans and natives—possibly 20 cases in all in 168 years of practice, so to speak—though I should fear too much dependence on the mere presence of albuminuria and too little use of the microscope in the diagnosis of some of these cases. They also speak of acute nephritis after malarial fever, diphtheria, measles, and after scarlet fever, where alone I have seen it. The nephritic complication of advanced pregnancy has appeared occasionally.

The Rocky Mountain region has been reputed as fostering the various diseases of the nervous system. A few rather grave cases of hysteria, rising to acute mania or degenerating to catalepsy and endangering life, have certainly suggested climatic aggravation. Chorea occurs occasionally, yet is not common. Epilepsy must be rare. Nervous functional disturbances in women and in advanced consumptives are of daily observation, and we learn to warn Eastern friends not to send here persons subject to such exacerbations.

I am satisfied that labors are shorter in New Mexico than in the northern Mississippi Valley, for instance, and that the lochial flow is of briefer duration.

The census of 1880 gave New Mexico unenviable supremacy in the United States as to the number of blind persons per thousand inhabitants. This seems to relate exclusively to the Mexicans, whose children meet innumerable accidents or suffer unrelieved from violent inflammations, for diseases of the eye, from cataract to conjunctivitis, do not seem to be over-frequent among Americans.

Here, also, I am able to corroborate Dr. Solly's exception this morning in favor of many cases of heart disease; when neither greatly advanced and when free from pulmonary and renal complication, these have seemed to sustain no detriment even though vigorous vocations and avocations were pursued. Let me now offer a few figures otherwise suggesting the healthfulness of this region.

Using the large statistics of the Odd Fellows' Order for a recent year, it appears that whereas there died in Louisiana 18 Odd Fellows out of each 1000, in Missouri and New Jersey each 13, in Massachusetts 11, in Ohio 10, in New Mexico the figures fell to 9 per 1000.

While in these other States from 9 to 12 per cent of all Odd Fellows received sick benefits, in New Mexico but 7.7 per cent were so relieved, or, stated otherwise, the mortality in these other States exceeded ours from 11 to 100 per cent, while the number of members shelved by disability was from 25 to 56 per cent higher than ours.

The time lost from his vocation by each sick Odd Fellow gives more striking results. While every such beneficiary in Massachusetts lost 7 weeks, in New Jersey 8, in Ohio 9, in

New Mexico he lost but $4\frac{1}{2}$ weeks (in 1889 it fell to 3 weeks for New Mexico) or, averaging the loss of valuable time for each member of the order, sick or well, it required only $1\frac{1}{8}$ Odd Fellows to use up a week in sickness in Ohio or New Jersey, in Massachusetts $1\frac{1}{2}$, while in this wholesome territory 3 Odd Fellows might be told off before a week was lost from disability. That is, in Ohio and New Jersey about threefold the time was lost by physical incapacity among these adult male wage-earning citizens as in New Mexico.

Wishing especially to mark the climatic merits of Las Vegas, I will add that with an average in 3 years of 88 members in its lodge, the percentage of relief was only 5 as against 7.7 in all New Mexico, or near 12 in Massachusetts, and it took $4\frac{1}{2}$ men to consume one week per annum in sickness as contrasted with 3 men per week for all New Mexico, or $1\frac{1}{8}$ for Ohio or New Jersey.*

A certain lodge in Ohio, accidentally chosen by me, relieved 22.5 per cent of its members against 5 per cent with us, or one week was lost for every $\frac{1}{2}$ an Odd Fellow in that lodge to 1 in $4\frac{1}{2}$ members in Las Vegas, or, finally, the Ohio lodge was nine times as sickly as my lodge.

Here let me remark that my humble figures are enhanced in value by the recollection that the average vitality of our community is decidedly diminished by the number of individuals or families already weakened by disease or sinister inheritance who have poured into our territory, and that an unusually large proportion of New Mexican Odd Fellows being railroad men or coal-miners, much of the disability has been from accidents. The only deaths that have occurred in my lodge in the past six years were one suicide, not in good standing, and so not entitled to receive funeral benefits or even be accounted for by the lodge, one visiting consumptive, inadvertently let into the lodge contrary to rules, and one old man with heart disease of long standing, who had sought better health in New Mexico, and, at last, after years of renewed usefulness, succumbed to pneumonia.

* The figures for the Las Vegas lodge would appear much more advantageous were I to omit one case where sick benefits were long drawn by a brother whose incapacity was dishonorably incurred, and he therefore not entitled to benefits.

I understand that a large part of the business of any Eastern domestic practitioner consists in attention to sick children. I also notice that in one year in New York City 47 per cent of all the deaths were in children under five years of age. Of course I do not presume to contrast a Rocky Mountain village with the great metropolis, but refer to these terrible figures to recall more vividly that disease and death are disproportionately active in "the States" among children at that tender age. So in Manchester, New Hampshire, during the July just past, in a total and extraordinary death loss of 124 persons, no fewer than 83 were two years old or under.

My own practice being essentially domestic, I questioned my books as to the children under five years of age waited on by me in a year.

Taking my cash book for easy reference, for the fifth year of a well-established practice in a town containing 2800 to 3000 Americans and as many Mexicans, with a considerable vicinage practice attended in town, I found that but $5\frac{1}{2}$ per cent of my receipts that twelvemonth was derived from the care of infants of the age specified. Of the money so received, $\frac{7}{5}$ came from the single case of a child brought in sick from a neighboring commonwealth, and $\frac{1}{10}$ arose from vaccinations, and no dollar of this represented a fatal case. These happy circumstances I attribute exclusively to the beneficence of our climate, and by no means to any excess of skill on my part in prevention or in cure.

No feature is more striking to a Las Vegas physician than the very large proportion of comparatively insignificant cases he sees, the infrequency of grave ones marked by the long spells in which, though earning something each day, his fever thermometer lies idle, or he need rarely use his skill in urinology.

Turning the leaves of my case book in search of evidence of gravity, I find in the first half of the same year (and that is always our busier half), one mild case of croupous pneumonia, three cases of catarrhal pneumonia (two in adults, one being fatal in a wrecked drunkard)—and this is not one of the scourges of juvenile life here as at the East,—two mild cases of facial erysipelas, one fatal case of puerperal fever, three cases of diphtheria, two being fatal, and three mild cases of typhoid-fever.

But the cases mounting highest in number were of indigestion and biliousness, eczema, pharyngitis, and tonsillitis—all of a rather mild type, though I suspect climatic relations for the digestive disorders, as discussed later, and for the skin and throat affections in the irritation of high dry winds carrying dust. Beyond these there was a large assortment of ailments strictly non-climatic, as poisoning, traumatic lesions, tape-worm, bunion, burns, besides vaccinations.

So, also, the number of deaths remained low in the first half of the present year, though an unprecedented invasion of zymotic diseases swept our community, largely increasing our work ; even the all-searching influenza causing but one non-Mexican death, in the person of an aged Turk living among the natives.

Of course the zymotic diseases will corrupt the healthiest climate where an ignorant peasantry delight in breeding contagion, or careless Americans hold public funerals after highly infectious diseases, or are content to use drinking water from their own door-yards, where the water stands on the same level in their privy, well, and cellar.

Some of the points in a four or five years' scrutiny of the Las Vegas American death-rate are of interest. In 1886, 1888, and 1889 there was one American death each year from croupous pneumonia, and none in 1887, and excepting two cases of phthisis, these were the only deaths from any pulmonary disease whatever among resident Americans.

Here it may be observed that bronchitis is rare, and always very mild, capillary bronchitis rarely seen, catarrhal pneumonia uncommon, and, as before stated, not so liable to affect children as at the East. Emphysema and asthma apparently never originate here.

The visiting invalids encroach upon our gross death-rate to the extent of from 22 to 56 per cent, nearly all being victims of advanced phthisis. In 1889 two Americans died of consumption not included in these : one a young woman from Missouri, long a sufferer from chronic gastric catarrh and deficient hepatic assimilation, who escorted here a phthisical relative (a possible case of direct infection) ; the other an old United States pensioner sadly broken with poverty and excess of opium and alcohol. These are rare examples of Ameri-

cans developing phthisis in this country under any circumstances.

Our resident American death-rate fluctuates from 6 to 12 per 1000; in 1888, when we had an unusual number of deaths from chronic disorders in elderly persons, as cancer, heart disease, alcoholism, besides reported old age, the rate reached 10 per 1000, in 1886 typhoid-fever and other zymotics ran it up to 12, in 1887 and 1889 it was 6 per 1000. But in a certain series of years 18 per cent of resident American deaths were from violence, as railroad accidents, suicides, accidental shooting, lightning, and mishaps with horses. No death was reported in these years from Bright's disease.

It must not be supposed that the Mexicans in their experience also accentuate the salubrity of the climate. Excepting a few of the better classes, an ill-fed, ignorant, shiftless race, with gross neglect of all sanitary rules or customs, their resisting power to disease is very feeble. A Spanish physician of nice culture, well skilled in physic, living in Las Vegas, kindly handed me his death list for the last year and a half, and it reached the startling figure of 48, and yet there are other physicians serving the natives, and many die having seen no physician. An American practitioner would think his labors most unfortunate were he to have a half dozen deaths in 18 months. About one-third of the Spanish doctors' deaths were attributed to various pulmonary disorders, another third to diphtheria, the mortality, however, reflecting no discredit on his ability. In 1886 I made a special scrutiny of the Mexican death-rate, finding it 20 $\frac{2}{3}$ per 1000, with a certainty that it was an underestimate, one-third of the dead being children under two years of age!

Wishing to avoid seeming recklessly to laud our climate, let me mention now what presents itself to me as the most serious disadvantage one encounters, say in Las Vegas, where length of residence and numbers of people enable me to speak with greater information and perhaps give some answer to the oft-put and embarrassing question: "What are your prevailing diseases?" I refer to the gastric and hepatic derangements which occur in frequency decidedly beyond any other class of functional disorders, though, unfortunately, not as regularly recognized by physicians as their current importance demands.

Attacks of acute gastric indigestion are very common at all seasons; chronic gastric catarrh is unpleasantly frequent; and fairly numerous are cases of disorder of the liver marked by enlargement, tenderness, and some fever, perhaps only a hyperæmia, due to portal congestion, occurring certainly oftener in well-cared-for women than in men, or even in those men given to alcohol. These hepatic seizures seem readily amenable to treatment and to leave no trace.

But more conspicuous than these, and perhaps really at the origin of them, is the very prevalent lithæmia. Not unfamiliar all along these mountains, it is remarkably prevalent in my community, notably among women in middle life, but occurring also among men, though less often because of greater activity and larger proportion of nitrogenous food. It has been very imperfectly recognized, and even physicians are seriously at fault, for not infrequently whole families are sent away at sacrifice to themselves and loss to the community, because of supposed inevitable pernicious effect of the altitude on wife or mother. Now this is needless, for moderate restriction in the use of carbo-hydrates and a more diligent pursuit of exercise for body and mind by out-door life, by more attention to the pleasures of society, or those varied philanthropic avocations in which woman shines—these promoters of metabolism will suffice to detain among us in comfort and usefulness those persons, generally of the better class, now so often permitted to emigrate.

Restricted diet is essential, for I have seen a hard-riding, vigorous young cattleman suffer severely from lithæmia, daily fearing sudden death in the saddle, attributing his woes to the altitude, his abundant exercise failing to compensate the over-tasked liver as it staggered before the stacks of half-cooked griddle cakes buried in molasses and washed down by a deluge of strong, oversweetened coffee, that served in lieu of a breakfast. Reform in his diet, with simple medication, affected a cure, soon, however, undone by a contemptuous return to the excess of carbo-hydrates, and, wailing over the baleful effects of the altitude he returned to his Eastern home.

These lithæmic conditions appear to be detrimental only as they temporarily embarrass the patient, though the books refer to ensuing degenerations of the arterial walls, etc.

Genuine articular gout has occurred in a number of these cases, with all typical symptoms, an indication, perhaps, that the gouty should not resort to this region.

There is good reason to believe that users of tobacco, coffee, and alcohol in this climate sooner reach a limit where pernicious effects arise ; and many of my patients have had relief from exalted nervousness or retarded tissue metamorphosis by partial or total abstinence from these drugs.

I am pretty sure that we have rather more cases of irritability of the neck of the bladder, not due to grave lesions, easily provoked by sundry causes, based probably on a lithæmic diathesis.

Much success has not attended my efforts to find a reason for this endemic defective metabolism. Whether an excess of sulphate of lime in the water, or some rarer alkali, as lithium, caesium, rubidium, might be present ; whether the larger loss of water through the skin leaving the tissues too dry for free metamorphosis—and Niemeyer said that the only local condition noticed in autopsies after muscular rheumatism—a purely lithæmic state, I believe—was a diminished portion of moisture in the tissues ; or, whether the new-comer in the higher altitude by being at first compelled to breathe more frequently and deeply, thus compensates for the deficiency of oxygen in the attenuated air, while later his respirations resume their former infrequency and shallowness—as I know they do—so reducing the supply of oxygen to the blood, and hampering metamorphosis—whether any of these suggestions has weight is very doubtful.

Las Vegas stands between the foot-hills and the great Mesa, with hundreds of feet of blue limestone and red and white sandstone beneath it, a tiny thread of a river running briskly through it over a stony bed ; no low or marshy tracts near it ; the adjacent lands treeless except for the evergreen timber on its backing foot-hills. Here we have a climate dry, a wind searching, averaging about as many miles per annum as in Colorado, a sky *generally* clear. August is the cloudy month of the year. Here is no trace of malaria as evidenced by periodicity in febrile attacks. The three cool months when invalids suffer most, January, February, and March, 1888, with a mean temperature for the three months of 37°, and the

rainfall but 1.31 inches, had a mean relative humidity of 43 with a minimum, in March, of 20.

Contrast this with Columbus, O., means for the same months, temperature 32° , rainfall 8.82, relative humidity 69° , or with Albany, N. Y., with the low mean temperature of 22° and the high mean relative humidity of 76, and rainfall of $10\frac{3}{4}$ inches. At low temperatures a close approximation of the figures for temperature and relative humidity mark a more tolerable atmospheric state for weak lungs and kidneys, or for any diminished vitality.

In a Las Vegas winter the heat and humidity figures generally run together; in Albany, for the three months, the humidity figure exceeded that of temperature $3\frac{1}{2}$ times, in January quintupled it.

In 1889 the relative humidity figures for the first three months of the year in Los Angeles and Berkeley, Cal., were 80 and 83, though the temperature was higher in proportion.

In keeping with this New Mexican dryness is the common high specific gravity of urine, so active is the elimination of moisture by the skin. The air, acting as a vast sponge, drying the skin by speedy absorption, and, though experimental data are not at hand, I am sure that our daily cutaneous transpiration far exceeds the two pounds allowed by the physiologies.

In life insurance examinations I commonly find the urine ranging from 1024 to 1030 in specific gravity. Visitors from the East have referred to me in alarm the fact of greatly diminished renal excretion. On one occasion on the plains a young soldier, the prey of profound nostalgia, who had sought refuge in the hospital, though presenting but a "mind diseased" to be "ministered to," passed 64 hours without micturition, and then, at my request, extruded 2 or 3 ounces of dark, faecal urine.

Dryness and brittleness of hair and nails are of daily notice.

Coupling these data of excessive aridity with the conspicuous absence of chronic degenerations of the kidneys, it would seem that our wide plains and the east slopes of these mountains afford a refuge for persons presenting the early evidences of such organic changes, a matter that Dr. Solly and Dr. Wilson have noticed favorably before this association, and Dr. Delafield elsewhere. The warning is wise, however, against

advanced cases coming to considerable altitudes, or those with severe cardiac lesions, though for them there still remains the lower elevation of the equally dry plains. And that I may absolve myself from appearance of undue devotion to the climatic merits of my town or territory, let me say that for a dozen years past I have sung the praises of the dry regions of Western Kansas at elevations of 2500 to 3500 feet, and am fairly satisfied that in that section lies the part of the United States most absolutely favorable to human health.

Our winter cold being associated with such constant dryness might be expected to serve the renal cases more favorably than the damper though warmer climates ; besides, have we not also for winter the equally dry but warmer Mesilla Valley, El Paso, Tucson ?

Certain life insurance reports gave to kidney diseases in all deaths occurring on the Rocky Mountain plateau and Pacific slope, a percentage of but 1.6 against nearly 9 per cent of all deaths occurring in New England, or the same in New York.

It has happened to me but rarely to meet an Eastern invalid seeking relief in my country for suspected incipient Bright's disease, and such have not lingered here.

It is to be regretted that already the same protest is raised against the westward migration of these chronic nephritis that has barred the path to healthful change in so many consumptives. Perhaps their Mecca will lie at the foot of Pike's Peak, where now the wealthiest consumptives seem to flock, while their impecunious brethren seek renewal in Las Vegas.

Finally, let me commend these arid regions of the West not only as a resort for those over whom the disasters of renal decadence or of pulmonary tubercular involvement are impending, but to those families who, by reason of adverse climatic environment or vicious hereditary or actual increasing debility, perceive a slenderness of constitution in their children, or dread an early prostration by chronic disease of any sort, and who seek relief from the impediments of malaria or excessive moisture.

To these the one time Great American Desert and the mountains named from their rocks offer salubrious homes, where more years of comfort and usefulness lie before their youth, and a better hope of rearing unscathed their children of tender age.

DISCUSSION.

Dr. Fisk: I have listened with considerable interest to the able paper of the reader. I regret that there is not a larger attendance of the members living in high altitudes, to have heard these interesting statistics.

I only have one or two ideas to express in connection with the paper. In the first place, I would like to speak about the renal troubles.

It is a very prevalent idea in Denver that as the perspiration is being taken up by our dry air, and the pores of the skin become plugged more easily, more work is being thrown upon the kidneys, and in consequence of this over-exertion on the part of the kidneys, renal troubles are more frequent. It is an opinion I have heard expressed by older practitioners, and by laymen as well. Unfortunately, I have no statistics to offer in connection with the subject. It is a branch of medicine that I have given a little attention to, however, and in my own practice I have had considerable to do with renal affections.

My experience does not bear out the assertion. Most of the renal complications which I have found existing in Colorado are the result of some previous illness. I have seen more Bright's disease—with casts—arising from scarlet-fever or diphtheria, or from pregnancy, than I have seen arising idiosyncratically.

I am not inclined to think, from my own experience, that this climate is conducive to such affections.

I have also watched, in connection with my private practice, and with life insurance work, the question of the increased specific gravity. Here again, I cannot bring any figures to bear upon the subject; but my very strong impression does not bear out the testimony of the reader. I am not inclined to think that the urine is of a higher specific gravity here than it is at lower altitudes. It is higher in the summer and lower in the winter, a change which occurs at sea-level as well as here.

In reference to the treatment of diabetes, I was formerly inclined to believe that it did not originate here. I remember looking up the subject some years ago, and on inquiry from my fellow-practitioners, I could find reports of but very few cases of diabetes, especially of the sugar kind—diabetes mellitus. I hear more frequently now of such cases than I used to.

I wish it were our good fortune here in Denver to corroborate the doctor's statement with reference to spinal paralysis, especially in children. We have it. I have seen quite a number of cases. Whether it is due to the fact of Denver's being a larger city, and having more cases to draw from, I cannot say, but we have it here.

There is one thing that I wish to say, with reference to lithæmia. I was very much interested in talking with the Vice-President of the Santa Fé Road some time ago, in a statement he made in reference to the cattle coming from the Rocky Mountain region. He said that at the stock-yards in Chicago the butchers could tell the Rocky Mountain animal from the fact that its liver and its kidneys were so healthy ; that it was the very rarest thing in the world to find diseased livers or kidneys in cattle coming from the Rocky Mountain region.

Dr. Denison : I am sure we all appreciate the reading of this very excellent paper. So far as my own experience is concerned, with reference to the question of urinal examinations—having considerable experience in examining for life insurance—it has impressed me with the fact that the author's conclusions are correct as to an increase. Exactly as to what that increase of specific gravity is, of course we differ ; but I think there is usually from two to four thousandths greater specific gravity in such examinations of healthy persons.

DOES SEGREGATION DIMINISH THE PREVALENCE OF PULMONARY CONSUMPTION?

By THOMAS J. MAYS, M.D., of Philadelphia.

THE February number of THE SANITARIAN contains a contribution from Dr. L. F. Flick, in which it is maintained that the separation of the consumptives from the healthy would "completely wipe out the disease in a single generation." Many of the views and conclusions which are expressed in this paper are, however, so much at variance with the facts as to entirely preclude the belief that any medical man who is at all familiar with the general statistical history of consumption during the last thirty years will be misled by it; and had it not appeared in THE SANITARIAN, a journal that is read by thousands of intelligent lay people, in whom it can only excite unnecessary alarm and work incalculable mischief, I should not undertake the disagreeable duty of briefly criticising it.

It can be safely said that a person's capacity for performing scientific work is always betrayed by the accuracy of the methods which he employs. Substantial research can hardly be said to consist in measuring the influence of one event on another by taking the first bearing of an observation twenty-five years after the conditions have ceased to operate. Yet this is precisely what Dr. Flick has done.

He details the history of the segregation of consumptives, which was vigorously practised by the Government of Naples from 1782 to about 1860 (for particulars of which I refer to his article, or to my address on "Hygiene," published in the Transactions of the Pennsylvania State Medical Society for 1890), and concludes, from an array of very recent statistics (1887), that this measure had the effect of stamping out this disease almost completely in the territory which was once known as the Kingdom of Naples. I am familiar with a number of other authors who have reflected and written on this strange episode in the sanitary history of Italy, but with none who ever reached the same singular conclusion. Brehmer (*Die Aetiologie der Chronischen Lungenschwindsucht*, p. 495) states: "Con-

cerning a diminution in the death-rate from pulmonary consumption in Naples and Portugal (where similar laws were enforced) the medical historians of that period are ignorant." According to Uffelmann (*Berliner Klin. Wochenschrift*, 1883, p. 369), Dr. de Renzi, the medical historian whom Dr. Flick quotes, states that the injury which had been inflicted on Naples by these laws was simply indescribable, and denounces the Neapolitan medical faculty in the severest terms for participating in their practical introduction.

Now, when Dr. Flick brings no evidence which was not also perfectly well known to his predecessors, and asks us to believe in the great beneficence of the operation of these laws from 1872 to 1860, simply because Naples shows a low consumption rate in the year 1887, he presumes too much on the simplicity of human nature. If he had consulted Vol. 45, p. 112, of the *British and Foreign Medico-Chirurgical Review* he would have found that Drs. Spatuzzi and Somma, "who have paid great attention to the mortuary returns in that city (Naples, about 1860), affirm that one-sixth, or a seventh of the whole mortality is due to phthisis," and that Dr. de Renzi "marvels greatly (in 1863) that the city of Naples is fully as much liable to phthisis as either London or Paris, though the salutary condition of the climate should render it far less common."

If the death-rate from consumption was the same in Naples at the time segregation ceased, as it was in other cities in which segregation was not practised, it is self-evident that such a measure can have no influence in diminishing the death-rate from this disease.

Dr. Flick ought to be aware that phthisis mortality is largely a matter of adaptation between man and his surroundings, and not one of contagion or isolation. Sanitary advances, better living, improved nutrition, and greater intelligence are the factors which lessen the deaths from phthisis in Europe as well as in our own country. Italy does not stand by itself in this respect. He admits himself that this may be lower in Spain, where no adhesion was ever given to such laws, so far as I know. According to Hirsch, some of the cantons of Switzerland have a death-rate which compares very favorably with that of Naples and of other Italian cities, and here isolation was never given a consideration.

The same is true of England. It is impossible that, as Dr. Flick teaches, the mere handful of consumptives which are accommodated in the consumption hospitals of England, and are thus isolated, can have the influence of reducing the death-rate from this disease 50 per cent among a population of 40,000,000 people. There is not a single American city of which we have statistics, that does not show a diminution of from 20 to 30 per cent in the mortality rate of this disease during the last 30 years, and we cannot boast of any hospitals where these patients are isolated.

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

ABSCESSES WHICH APPEAR IN THE COURSE OF TYPHOID-FEVER was the subject of an interesting paper presented to the Société Médicale des Hopiteaux, of Paris, recently, by M. Raymond. The discussion which followed, as reported in *Le Progrès Médicale*, of February 28th, developed several interesting facts with regard to the pathology of the complication. According to M. Raymond, the abscesses depend on a variety of pathological conditions. Sometimes they are due to a secondary infection by pyogenic microbes; sometimes they seem to be caused by the bacillus of Eberth, which may be found alone or with other microbes. Similar abscesses have been produced experimentally in rabbits by the bacillus of Eberth.

He had recently had an opportunity, he said, to observe a patient attacked with typhoid-fever, who showed the peculiar symptoms of acute delirium, and an extensive abscess of the abdominal walls, without communication with the peritoneal cavity. This patient died while in a comatose condition. Three interesting points are presented in the case :

i. It has been asserted that this form of delirium occurs only in those specially predisposed. Such was the case with this patient, whose father was a victim of alcoholism, and who was herself of an improvident and fickle character.

2. It might be supposed that the delirium was caused by the presence of bacilli in the nerve centres or in the meninges, as described by Klebs. In our patient there was no suppuration of the meninges. In two others who presented the same form of delirium the bacteriological examination was negative. The presence of bacilli is, therefore, not necessarily the producing cause of the delirium. According to some authors the delirium is, in some way, a normal manifestation in typhoid-fever, and depends on microchemical alterations which lead to a degeneracy of the cerebral cells. This seems to have been the case in the patient we are considering, who, on account of her age and a certain amount of obesity, presented a tendency to degeneration of the cerebral cells.

3. The bacillus in the pus of the abscesses, examined with the greatest care, and when reproduced by culture, was demonstrated to be the bacillus of Eberth alone. We may conclude, therefore, from this case, that the bacillus of Eberth may be pyogenic, without affirming that it is the agent in all the supurations found in typhoid-fever.

M. Chautemesse said : "The possibility of the production of pus by the bacillus of Eberth is a fact now fully recognized, but the very interesting observation of M. Raymond gives it additional proof. It is at the time when the bacillus of Eberth has lost its special virulence that it produces suppuration. It is for this reason that whenever it is the exciting cause the abscesses are observed toward the termination of the typhus-fever. Experimentally the pus of the bacillus of typhoid-fever has been produced by inoculating animals refractory to typhoid. Many cases have lately been cited in which the bacillus of Eberth has been found in the nerve centres. These bacilli may act in a manner similar to that which M. Massé has attributed to them in the production of certain cases of sclerosis of the medulla, which appear to be consecutive to some previous infectious disease."

M. Raymond agreed in this opinion with M. Chautemesse and M. Marie.

M. Chautemesse presented two reports taken from the returns made by the Minister of War to the President of the Republic, showing the diminution of mortality and of morbidity from typhoid-fever, in the whole French Army and in

the military department of Paris, in which proper sanitary measures have been adopted more rapidly and more perfectly than elsewhere. From these reports it appears that during the year 1890 the morbidity of typhoid-fever was reduced one half, and the mortality one third.

These results are due to two very important measures : the disuse of permanent pits, and the distribution of pure water, either by bringing it from springs, when the nature of the country admits of such a measure, or by the use of filters in the barracks, when there is a possibility that the water may be contaminated. The report noted the fact that these measures were due to the persistent efforts of M. Brouardel.

M. Guyot remarked that, in a village, it is impossible to adopt measures of that kind, for, in the case of the contamination of a well, it would be impossible to oblige the owner to close it, or to prevent him from using the water. It would be necessary, in such cases, to change the law, for, in the present condition, we can count only on the good-will and the intelligence of the inhabitants, and that is not very satisfactory as things now exist.

A CASE OF TRISMUS NEONATORUM TREATED WITH SULFONAL.—Dr. Julius Berenyi reports the case of a child eight days old, who developed tetanus on the fifth day after birth. On examination he found the internal organs normal ; the pulse was 148°, the respirations 50 and quiet. The paroxysms were initiated by crying fits and great restlessness. The skin assumed a bluish color, and around the root of the nose the integument was thrown into thick folds. The nostrils became distended, the buccinators were rigid, the mouth was slightly opened, but would not admit the tip of the little finger. The abdominal wall was hard and tense, the upper extremities crossed in a flexid position over the chest ; the thumbs were spasmodically flexed inward ; the vertebral column was perfectly rigid. From nine o'clock in the morning to two o'clock in the afternoon the little patient had five attacks, of which the fourth lasted an hour. Berenyi administered twenty centigrammes of sulfonal in an enema, and also gave the drug by the mouth. After the fifth attack, which was less intense than the others, the child began to take the breast. On the same day three

attacks of diminished severity occurred. On the following day the paroxysms became less frequent and intense, and on the sixth day they had disappeared completely. Altogether ten grammes of sulfonal were employed, without the occurrence of somnolence or disagreeable after-effects.—*Pester Mediz-Chirurg, Presse*, Nov. 7th, 1891. *Therapeut., Monatsh*, March, 1891.

INTESTINAL INDIGESTION is said to be effectually treated by the use of *Pancrobin*, a combination of pancreatin and bile. In a paper read by Dr. R. Harvey Reed, of Mansfield, O., at a recent meeting of the North Central Ohio Medical Society at that place, he says of it : “ In cases where there is a diminished quantity, or even an absence, of these natural products, especially the bile, resulting in the distressing complication of intestinal or duodenal indigestion, and constipation attended with flatulence, the result of an inactive liver, I have found this remedy of great value, promptly relieving the flatulence, and producing natural colored stools of a normal consistency, in place of the pale ash-colored fæces, or the dry, hard scybala, of the chronic dyspeptic.”—*American Lancet*.

PAPINE.—Dr. Samuel E. Woody, Professor of Chemistry and Public Hygiene, and Lecturer on Diseases of Children, Kentucky School of Medicine, at Louisville, reported recently a case of acute dysentery of unusual severity, requiring large doses of opium, in which he used *Papine*, for its purely hypnotic and anodyne effects, with the happiest results—using no other form of opium.

GARLIC AND ASSAFŒTIDA.—At a recent convention of health officers in Ohio, Dr. C. O. Probst, Secretary of the State Board of Health, submitted the following (clipped from a medical journal in regard to a certain town in the State) : A town in Ohio is at present suffering an epidemic of diphtheria ; but the town has a Board of Health that is fully awake to its responsibilities as a prophylactic power, and it addresses a circular letter of instructions to the citizens, from which we take the following : “ Second, we recommend that every child wear next its person, and suspended by tape from the neck, a little sack made of open materials, containing equal portions

of gum camphor, gum assafœtida and carbonate of ammonia. Also, that onions be freely used as an article of diet, and the children be required to partake freely thereof, at least once a day. That a small portion of flour of sulphur be given every third evening upon retiring ; and that on the first symptoms of sore throat a physician be called.” Probably the intention of these measures is to make each child so aromatically offensive that no disease germ of any sensibility whatever can be tempted to take up its habitation in such a malodorous locality. With this end in view the precautions are well taken : assafœtida and ammonia can certainly guard the cutaneous surface, the fumes arising from a daily use of onions will effectually bar admission by the air-passages, and any enterprising germ who attempts to gain a foothold in the citadel by the rear entrance will encounter the stifling effects of a sulphur diet, and wish he hadn’t tried it. The sensible suggestion which closes the above quotation redeems it from utter absurdity.

SURGICAL INSTRUMENTS.—MESSRS. HAZARD, HAZARD & CO., New York, announce that MR. WILLIAM A. KIRCHHOFF, for many years connected with the Surgical Instrument trade, has been placed in charge of their INSTRUMENT DEPARTMENT. Mr. Kirchhoff is perfectly familiar with the manufacturing of Surgical Instruments of all kinds, either upon special design from physicians or regular patterns. He is not surpassed by any other man in the business.

Their Instrument Factory is continued with the same superintendent, Mr. Boecker, and the same workmen as for years past, and the instruments produced are of the best quality at the lowest price.

THE RED CROSS SOCIETY OF BROOKLYN.—The District Nurse of the Red Cross Society of Brooklyn is in readiness to answer calls for her services. At the request of the physician attending the case, she will visit the sick poor, carry out instructions for treatment or nursing, and in every possible way co-operate with and assist the attending physician. Her services are free, and intended only for those who are unable to employ a nurse. Calls from any part of Brooklyn may be sent, by postal or telephone, to the Directory for Nurses, 356 Bridge Street, Brooklyn, N. Y.

EDITOR'S TABLE.

ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL,
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THE TRUTH ABOUT VACCINATION.

II.

IN my first article I stated that "the stories told about the fearful mortality from small-pox prior to the introduction of vaccination are entirely without foundation in fact, for in pre-vaccination times the death-rate was 18.8 per cent, while the percentage of deaths since 1870, with 95 per cent of the population vaccinated, is 18.5 per cent."

To this the Editor of THE SANITARIAN replies in these words : "The incredibility of the authority cited in defence of this statement is shown by the unverifiable assertions in the quotation which follows, and the garbled statistics adduced to support it." He then goes on to give a series of statistics from the transactions of the Epidemiological Society of London, and also quotes the late Dr. William Farr, for many years Registrar-General of England, as authority for his figures.

It is easy for the interested to prove anything by statistics, and when we remember that those published by the Epidemiological Society of London were largely compiled by Sir John Simon, when drawing a large salary as the medical officer of the Board of Health, who had charge of the public vaccinations, it is easy to see that his interests did not lie in the direction of showing that vaccination had not reduced the mortality of small-pox.

The percentages above quoted are from the only statistics extant on the subject, and they embrace the substance of the reports of Van Swieten, Jurin, Lambert, Monteith and Duvillard, from the London, Vienna, Zurich, Newcastle and Massachusetts hospitals, and also the facts stated in Rees's Cyclopædia article, "Inoculation." For verification of these figures

see Appendix 3, page 201, of the Third Report of the Royal Commission, appointed to inquire into the subject of vaccination, with minutes of evidence and appendices, 1890.

In weighing testimony it is the rule to inquire if the witness is in any way interested in the result of the investigation. "When we apply this rule to the vaccination inquiry, we find that the advocates of vaccination, and the compilers of the pro-vaccination statistics, are either public vaccinators, physicians who receive a large yearly aggregate of fees for private vaccinations, and those who accept the truth of vaccination because the profession believe in it. On the contrary, those who oppose vaccination have nothing to gain, and much to lose, by expressing their honest convictions.

When I first began to investigate the subject, I believed thoroughly in vaccination, because I had been taught to do so. I changed my views after carefully studying the subject, and before I ever read a line of anti-vaccination literature. I first found that before Jenner's time as much was said in favor of inoculation as a preventive of the ravages of small-pox, as has since been said in favor of vaccination. When the latter received the indorsement of influential people in London, it was then declared that inoculation spread the disease instead of checking it, and the practice was soon prohibited by Act of Parliament in England.

Then began an effort to show the fearful mortality of small-pox when uninfluenced by vaccination.

It was stated that in 1520 three and a half millions of people died from small-pox in Mexico, and this story has become one of the foundation-stones of the success of vaccination in preventing small-pox. Will Dr. Bell tell us how these figures are verified, and at the same time who took the vital statistics of Mexico twenty-eight years after the discovery of America?

When we come down to a comparatively recent date, we find the same attempt at falsification and misrepresentation of statistics.

The National Vaccine Establishment of England was created by Act of Parliament in 1808. The Board of Managers of this establishment in their report for 1811, wrote as follows :

" Previous to the discovery of vaccination, the average number of deaths by small-pox within the London bills of

mortality was 2000 annually; whereas during 1811, only 751 died of the disease," etc.

In 1818 this Board again says :

" Instead of 2000 deaths by small-pox, which was the annual average previous to the practice of vaccination, there died in 1818, only 421."

In 1826 we find in the report of this same Board these words :

" But when we reflect that before the introduction of vaccination the average number of deaths from small-pox was annually about 4000, no stronger argument can reasonably be demanded in favor of the value of this important discovery."

Again, in 1836, the paid officials of this vaccine establishment, encouraged by the fact that their report of 1826 had not been questioned, still further falsify facts by the following report :

" The annual loss of life by small-pox in the metropolis before vaccination was established, exceeded 5000."

The truth is that small-pox was unknown in London till 1629, during which year seventy-two persons died from it. From 1637 to 1647 it was again unknown, and only three times prior to 1717, when inoculation was introduced, did the mortality exceed 2000 annually, while it often fell below 500, and very frequently below 1000. In 1782 only 636 persons died from small-pox in London, while in 1797, the year before Jenner promulgated his vaccination theory, only 522 deaths from small-pox occurred. Only seven times in the 200 years prior to 1789 did the death-rate exceed 3000 and never once reached 4000, while it was under 1000 per year in 70 out of the 200 years.

It is true that in 1818 there were only 421 deaths from small-pox, as above quoted, but there was an increase again every year till 1825, when there were 1299 deaths, while in 1838 there were 3817, which was the highest mortality known in the history of London to that date. These figures * are quoted here to show the method adopted by the vaccine institutions in manufacturing statistics, if the quotations from their own reports are not sufficient.

* Third Report of the Royal Commission, Appendix No. 10, pp. 289 and 291. Also Fifty-Second Annual Report of the Registrar-General of England, 1889.

These figures, with the statistics quoted in my first article, are all taken from official English reports.

The late Dr. Farr, whom Dr. Bell justly calls "one of the most renowned and universally accepted statistical authorities of the present century," in speaking of the decline of small-pox, says :

" Small-pox attained its maximum mortality after inoculation was introduced. The annual deaths from small-pox in London, from 1760 to 1799, were on an average 2323. In the next twenty years, 1780 to 1799, they declined to 1740. The disease, therefore, began to grow less fatal before vaccination was discovered, indicating, together with the diminution of fevers, the general improvement of health then taking place."

Now a word in regard to Sweden. From 1752 to 1773 Sweden suffered as no other country ever did from small-pox, and again in 1778 and 1784, the severest epidemic being in 1778, when 16,607 persons are said to have died from small-pox. In 1786 there were only 671 deaths, and for the next four years there were less than 2000 deaths annually. The last great epidemic was in 1800, when there were 12,000, against 6000 in 1801 and 1533 in 1802.

Though vaccination was introduced into Sweden in 1801, not more than 40 persons in a thousand were vaccinated till 1816, when it was made compulsory and gratuitous. In 1816 the mortality had gradually fallen to less than 300 per million. It kept declining until the decade 1841-50, when the annual average death-rate fell to 212 per million living; but for 1851-60 it rose to 862 per million, and to 867 in 1861-70, while in 1871-80 it reaches over 1000 per million. In 1874, in Stockholm alone, there were 1191 deaths from small-pox out of a population of 150,000—a death-rate of 7940 per million.* Yet for many years before that it was claimed that Sweden was the best vaccinated country in the world, and that small-pox had been stamped out by it.

As an offset to Dr. Ogle's statistics, let us take the mortality of London, where epidemics occur, and where vaccination is the most thoroughly enforced, and what do we find?

* Tables relative to vaccination in Sweden, 1774-1878. By P. A. Silijestrom.

In 1871, after 93 years of vaccination and 38 years of compulsory vaccination, there were 2422 deaths from small-pox per million living, the greatest mortality in the history of the city. Again, in 1881, there were 618* deaths per million, the third highest rate in the century.

It is true that in 1889 there was not a single death from small-pox in London, and only one in all England. But periods of immunity always precede epidemics, and then it is claimed that vaccination has stamped out small-pox; but when an epidemic shows itself the claim is made that the vaccinations have been imperfectly performed.

Dr. Bell's conclusion is the most remarkable utterance I have yet seen on this subject. He says: "It shows conclusively that the saving of life from small-pox which has been effected has been by vaccination alone, and not by improved sanitation generally."

If this is true, why quarantine small-pox patients? Why fumigate and disinfect the house where small-pox has been? Why do we find the disease mostly among the poor and filthy districts of our city? Why do the feeble and sickly take the disease whether vaccinated or not, while the robust and healthy usually escape?

In conclusion, I would ask, Does the decline of small-pox mortality decrease the general mortality? Let the report of the Registrar-General of England answer. In 1870 there died in England from all causes 515,329, and from small-pox, 2547; in 1871, from all causes, 514,879, and from small-pox, 23,062. A similar comparison will show similar results, and on such a basis we could logically say that a small-pox epidemic actually diminishes the mortality of a nation.

ROBERT A. GUNN, M.D.

DR. BELL'S REPLY.

APROPOS to the reiteration with which the foregoing communication begins, and of which, in substance, it chiefly consists, we submit the following from the accomplished Secretary of the State Board of Health of Massachusetts:

* Fifty-second Annual Report of the Registrar-General of England, page 47.

BOSTON, March 28, 1891.

DEAR DOCTOR BELL: Your correspondent, Dr. Gunn, gives a few statistics relative to small-pox before and after vaccination; but it appears that, like many other anti-vaccinists, he is given to juggling with the facts. For example, on page 258 of THE SANITARIAN (March, 1891), he states: "In Sweden, from 1779 to 1792, without vaccination, and during a time when inoculation was practised, the deaths from

DEATHS FROM SMALL-POX IN SWEDEN.

Year.	Vaccinated per 1000 Inhabitants.	Deaths from Small- pox per Million Inhabitants.
1774	0	1000
1775	0	600
1776	0	700
1777	0	950
1778	0	3150
1779	0	7150
1780	0	1600
1781	0	700
1782	0	1150
1783	0	1900
1784	0	5800
1785	0	2300
1786	0	300
1787	0	800
1788	0	2500
1789	0	3100
1790	0	2600
1791	0	1400
1792	0	850
1793	0	950
1794	0	1750
1795	0	2900
1796	0	1900
1797	0	750
1798	0	550
1799	0	1600
1800	0	5100
1801	0	2550
1825	250	400
1839	590	575
1851	735	700
1874	970	960

small-pox per million inhabitants ranged from 300 to 900 per year," etc. On the top of the next page he also presents a table, in which he has selected *epidemic years only* for the support of his argument. Now, let us examine the actual facts, and prolong this table back into the last century prior to the introduction of vaccination.

The complete table on the preceding page is copied from the excellent diagram of Mr. Haile in the British Parliamentary Report of 1871, which was made up from data obtained from the Swedish Government.

An examination of this table shows that only in 10 years out of the 28, prior to the introduction of vaccination, did the death-rate from small-pox fall as low as the rate of even the highest of the epidemic years quoted by Dr. Gunn. I present also another brief table, made up upon the same ratio, for Boston, epidemic years only being presented, as in Dr. Gunn's table :

DEATHS FROM SMALL-POX IN BOSTON. EPIDEMIC YEARS ONLY.

BEFORE AND AFTER VACCINATION.

Year.	Deaths per Million Inhabitants from Small-pox.
Before vaccination.	1702.....31,500
	1721.....77,300
	1730.....33,300
	1752.....36,200
	1764.....10,900
	1776.....10,000
	1778.....6,100
	1792.....9,900
After vaccination.	1839.....900
	1840.....1,230
	1850.....1,400
	1859.....970
	1872.....2,950
	1873.....1,210

Dr. Creighton's article in the Encyclopædia Britannica, which Dr. Gunn quotes so largely, is not sanctioned by the medical profession, and the publishers of the Cyclopædia were compelled by public opinion to give a true statement of

the case in a supplementary volume. The London *Lancet* describes the paper of Creighton as a piece of "pathological transcendentalism," and says he "has no claim to be considered an authority on practical medicine."

There is one point in regard to vaccination which has never been answered by the anti-vaccinists, and that is, the effect of vaccination in altering the death-rate at different ages of life.

Small-pox in the last century (as also among the unvaccinated in the present century), was a children's disease. This is shown very clearly by the statistics of Geneva, as well as by those of Kilmarnock, in Scotland. The following quotation from Dr. McVail's report to the Local Government Board of England upon the history of small-pox in Kilmarnock in the last century, is pertinent to the question :

" As regards small-pox, there were, in fact, three Kilmarnocks. One, a Kilmarnock of 3700 persons, had no fear of its attacks. These had already met and battled with the disease-fiend. On many were to be seen the marks of the conflict. Some were blind, some had lost their hearing, many were permanently injured in constitution, and very many were scarred and disfigured for life ; and, for every one that conquered, another had fallen, never to rise again. There was indeed a second Kilmarnock under the green sod of the kirkyard. The Kilmarnock which had reason to dread the epidemic's approach was a Kilmarnock the least able to meet it. It consisted of a band of little children, numbering less than 500 in all. Every such group that came into existence had to face, within four or five years of its birth, the most terrible physical enemy that it would ever meet ; and, having fought the battle, some were added to the maimed and distorted who formed so large a portion of the population, and others were laid beside those who had been destroyed by former epidemics. One can barely imagine what must have been the feelings of a mother regarding these fearful visitations. Even where the town was free from the pestilence, there would be the constant foreboding of its all-too-certain coming ; and when at last the first case occurred—when the doctor was called in, and pronounced the disease to be the dreaded pox—his words would be heard as a sentence of death to some member of

almost every family containing little ones ; and, as the news spread from house to house, with what a despairing clutch would each mother press her darling to her breast, and beg Almighty God to command the destroying angel to pass by her door ! After the lapse of a hundred and fifty years, one can have little conception of the real meaning of a small-pox epidemic. But the old parish register has enabled us to apprehend something of its horror ; and I venture to say that, if the anti-vaccinationists had their will, we would ere many years be again experiencing somewhat of the awful visitations which were so familiar in old Kilmarnock."

The changes wrought by vaccination in this age-incidence are very clearly shown by the following table, in which are shown the ages at which people die of small-pox, among the vaccinated and among the unvaccinated.

In every country where observations have been made with reference to the age-distribution of small-pox mortality, similar results are noticed, and the immunity of the first five years of life is found to depend very largely upon the extent to which primary vaccinations are conducted. Other things being equal—that is, the quality of the lymph used, and the carefulness and thoroughness with which it is used, the greatest freedom from small-pox in the earlier years of life will be found in those countries and in those municipalities in which the ratio of annual vaccinations approaches nearest to the number of living and surviving births in such community.

The statistics appended illustrate this statement.

On turning to my copy of the Registrar-General's report for 1883 (46th), I fail to find the figures which Dr. Gunn quotes. I do find, however, the following statement, on page xvi. of that report : " Assuming the ordinarily received estimate to be correct, that only 1 out of 20 persons on the average is unvaccinated, there were, in 1883, for equal numbers living, *more than 39 deaths among the unvaccinated, to 1 death among the vaccinated.*"

Again, in Dr. Barry's excellent and very thorough report of the epidemic in Sheffield in 1887-88, he says, page xvi. :

" Of the children under 10 years of age living in Sheffield during 1887-88 under the common conditions of infection in

DEATHS FROM SMALL-POX IN DIFFERENT COUNTRIES BY AGE-PERIODS.
IN EACH.*

AGES.	Before introduction of vaccination.	Japan. 1879-1880.	Netherlands. 1870-73.	Brussels. 1883. Epidemic year.	Buda-Pesth. 1876-1881.	Massachusetts. 1863-1886.	Vaccination moderately enforced.
	Geneva. 1580-1760.	Kilmarnock. 1728-1764.	Vaccinated.	Unvaccinated.	Vaccinated.	Unvaccinated.	Laws and en- forcement generally very lax.
0-1.....	....	189	....	....	....	....	....
1-2.....	....	235	....	....	....	....	....
2-3.....	....	219	....	....	....	....	....
3-4.....	....	162	....	....	....	....	....
4-5.....	....	137	....	....	....	....	....
0-5.....	805 ¹ / ₂	942	137	519 101	478 204	200	766
5-10.....	155 ¹ / ₂	39	194	216	154	204	520
10-20.....	26 ¹ / ₂	5	447	196	187	154	155
20-30.....	10	5	177	46	222	71	126
30-40.....	{ 2 ¹ / ₂	....	41	17	411	95	119
40 and upward..	Not stated.....	1,000	14 1,000	4 1,000	6 1,000	.... 1,000	87 48 64 1,000 1,000 1,000 1,000

* Article on Vaccination in Wood's Reference Hand-Book, vol. viii.

the whole borough. Per thousand of the number of children in each class :

The attack-rate of the vaccinated was.....	5
The attack-rate of the unvaccinated was.....	101
The death-rate of the vaccinated was.....	0.09
The death-rate of the unvaccinated was.....	44."

Yours very truly,

S. W. ABBOTT.

To what Dr. Abbott has so well said with regard to Dr. Gunn's previous communication (in March number), and so fittingly with regard to the immediately preceding, without any knowledge of it, lest Dr. Gunn should think some of his points insufficiently replied to :

The statistics of Van Swieten and others, from whom he quotes "the only statistics extant on the subject," of death-rate from small-pox in prevaccination times, which he seems to regard as the basis of his argument, were collected from the uncertain data of eruptive diseases before small-pox in England was generally distinguished from plague and measles, though it had undoubtedly prevailed there, more or less, for many centuries previously.

Sydenham was the first to clearly differentiate the disease in England in the latter part of the seventeenth century, after which it apparently grew less fatal, because it was distinguished from other diseases ; but the statistics with regard to the death-rate from it, even a century later, from which Dr. Gunn quotes, are comparatively worthless. By them at least nothing can be proven, Dr. Gunn to the contrary notwithstanding.

His attempt to discredit the statistics of the Epidemiological Society of London, and of the Registrar-Generals of England, because they have been collated by officials interested in the protection of the public health, is too preposterous for consideration.

By whom it was stated "that in 1520 three and a half millions of people died from small-pox in Mexico," our proponent should himself be able, if any one can, to point out ; but the authorities for the prevalence of an exceedingly fatal epidemic of the disease at about that time in Mexico, cited

by Prescott, are Herara, "General History," etc., and Torilio, "Histoire de las Indios." The disease is said to have been introduced by a negro slave from the fleet of Narvaez.

That Dr. Gunn is so much surprised at "Dr. Bell's remarkable utterance, that the saving of life from small-pox which has been effected has been by vaccination alone, and not by improved sanitation generally," is doubtless because he has not studied the true relations of unsanitary conditions to infectious diseases; they never *cause* them, though they commonly promote their planting and propagation; and of like nature with regard to small-pox particularly, persons who are not vaccinated are in a constant state of receptivity to that disease; and so long as anti-vaccinationists exist and influence people to maintain such a state of personal receptivity, it will continue to be necessary to protect such people by the quarantine of small-pox patients and the disinfection of fomites.

That the feeble and sickly are, generally speaking, more likely—though this is questionable—to contract small-pox than the robust and healthy, is, to say the least, equally applicable to all diseases; *stamina* is an important condition against disease in all its aspects.

That epidemics of small-pox, even sometimes, are as other epidemic diseases, followed by a lessening of the death-rate from other causes, is because of the practical sanitary measures commonly instituted against the propagation of the epidemic. But no amount of practical sanitation without vaccination will avert an epidemic of small-pox in an unvaccinated community.

THE STATUS OF HYGIENE IN GERMANY.—In the latest number of the *Centralblatt für Allgemeine Gesundheitspflege* (X. 1), a list is given of the professorships of Hygiene in the German Universities, with the names of the several professors. The number and quality of these is highly significant of the progress which preventive medicine has already made and is making in Germany.

They are as follows: Koch, in Berlin; Finkelnburg, in Bonn; Flügge, in Breslau; Wolffhügel, in Göttingen; Löffler,

in Greifswald ; Renk, in Halle ; Bockendahl and Fischer, in Kiel ; Fraenkel, in Königsberg ; Rubner, in Marburg ; Schottelius, in Freiburg ; Knauff, in Heidelberg ; Rosenthal, in Erlanger ; v. Pettenkofer, in Munich ; Lehmann, in Würzburg ; Gaffky, in Giessen ; Uffelmann, in Rostock ; Hoffmann, in Leipzig ; Gartner, in Jena. Tübingen and Strassburg appear to be the only German Universities which have no special professors of Hygiene.

It would be difficult to bring forward any better evidence of the superiority of Germany in respect to scientific medical education than this list affords. A similar list of English or American foundations of this kind would be instructive though humiliating.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, March 7th, 1891, published an article on the London *Lancet*, which points to the course it, or, rather, those who direct it, should emulate. Having tried unsuccessfully to obtain that degree of confidence and patronage which was hoped for it, considering the auspices under which it began, with one of the most accomplished physicians in the country as its editor-in-chief, and again, with increasing dissatisfaction, by another of the same kind, it is apparent that the special need of the Journal is an editor such as Thomas Wakley declared himself to be at the outset of the *Lancet*.

All editors of experience know that the qualifications of mere observers, particularly those who are so surcharged with other occupation as to have no time to devote to the mass of literature afloat, with a view to the elimination and use of all that is valuable therefrom to the best advantage, have, in their own estimation, a much better comprehension of editorial duties and labors than those who, like Wakley, wholly disembarrass themselves of all other encumbrances.

When Mr. Wakley took up the *Lancet* he is reported to have said, in a public speech : "I forswear medical practice. I use only the lancet, and that in the form of a quill."

Thus equipped, he enlisted for a relentless war against empiricism of all kinds ; against those within the profession as well as those who menaced it from without, whether sustained by Government patronage, ignorance of the true needs of the

profession, or otherwise, whoever and whatever stood in the way of professional honor and advancement, were, from his point of view, alike odious and leprous ; and with him there was no turning back. And who that is old enough to have taken post-mortem notes on Wakley's battle-field, or had sufficient editorial enterprise to read his imperishable history of the war, can fail to recognize his elements of success, or neglect the effort to profit by his example ?

Think of such an editor of the Journal, and turn to an editorial under the caption of *Should Physicians Study Latin?* in the number for March 21st, and read it under the shadow of JOHN H. RAUCH'S effort to improve the educational standard of the medical profession.

The first editor of the Journal was a Wakley, but he was handicapped by a sufficient amount of other professional work to occupy the whole of his time, and a load of trustees on his back besides. He was soon found blowing hot and cold with the same breath, denouncing proprietary medicines of all sorts, and accepting the money of those who advertised them in the Journal !

But no one who knows N. S. DAVIS believes him to be guilty of such inconsistency, or to be deficient in the courage of his convictions at any hazard ; a manager was added to his load. That he retired from such a compromise is perfectly consistent with his character.

To the impersonal editorship which succeeded him is due such editorials as the one above referred to, more as a specimen than as an exception. It is of a piece with the sectionalism which is now the Journal's leading characteristic.

And here it may be remarked that, at the outset, the *place* of issue of the Journal was wholly incidental. The choice of the Association was N. S. DAVIS ; it was at Chicago on *his* account, notwithstanding the place. And with regard to the question of its removal from Chicago to Washington, for which we have voted four times recently, in reply to as many correspondents, we are decidedly of the opinion that Washington, besides having the best Medical Library in the country, the best Medical Museum, and the only Museum of Hygiene, and numerous other institutions and advantages, would, more than any other place, tend to divest the interests of the Jour-

nal of all sectionalism, and concentrate them upon its legitimate purpose—the advancement of the medical profession. But to this end it should be exclusively equipped and conducted as was the *Lancet*.

THE AMERICAN ACADEMY OF MEDICINE will hold its sixteenth annual meeting at Washington, D. C., May 2d-4th opening at 3 P.M.

As it will be just previous to the meeting of THE AMERICAN MEDICAL ASSOCIATION, to open May 5th, members will be enabled to attend both meetings with the least possible inconvenience.

THE CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS will be held at Washington, from 3 to 6 P.M., September 22d-25th, 1891. William Pepper, M.D., of Philadelphia, Chairman of the Executive Committee.

TO CORRESPONDENTS.

"THE Boston correspondent of the *Book Buyer*," says the *Living Church*, "quotes the following letter, sent by T. B. Aldrich to Professor E. S. Morse, of Salem, Mass., ex-President of the American Academy for the Advancement of Science. Professor Morse, it should be said, has a handwriting quite indescribable in illegibility :

" MY DEAR MR. MORSE : It was very pleasant for me to get a letter from you the other day. Perhaps I should have found it pleasanter if I had been able to decipher it. I don't think I mastered anything beyond the date (which I knew) and the signature (which I guessed at). There's a singular and perpetual charm in a letter of yours ; it never grows old, it never loses its novelty. One can say to one's self every morning : 'There's that letter of Morse's ; I haven't read it yet. I think I'll take another shy at it to-day, and may be I shall be able, in the course of a few years, to make out what he means by those t's that look like w's, and those i's that haven't any eyebrows.' Other letters are read and thrown away and forgotten, but yours are kept forever—unread. One of them will last a reasonable man a lifetime.

" Admiringly yours,

" T. B. ALDRICH."

OBITUARY.

HOSMER ALLEN JOHNSON, of Chicago, died at his home February 26th, 1891. He was born in Wales, Erie County, N. Y., October 22d, 1822, where he spent his early boyhood.

In the year 1841 he entered an academy at Romeo, Mich., where he prepared for college, and thence entered the University of Michigan, from which he graduated in 1849.

His educational career showed a remarkable talent for the acquisition of languages, both ancient and modern, and he studied Latin, Greek, Hebrew, French, German, Italian, and Spanish. Three years after taking his A.B. he received the degree of A.M., and at a later period that of LL.D.

After graduation he went to Chicago and commenced the study of medicine, and in 1852 graduated in Rush Medical College. In 1853 he became a member of the faculty, and continued with it until 1858, when he resigned. Not long after his resignation he united with a few others in founding the Chicago Medical College, in which he was a professor and trustee from the beginning to the day of his death, and was the first president of the faculty.

He was also one of the founders of the Chicago Academy of Sciences, of the Historical Society, and of the Astronomical Society; member of the American Public Health Association, and its President in 1889.

He was for some years editor of the *Northwestern Medical Journal*, and afterward a member of the City, State, and National Boards of Health. During the War of the Rebellion he was commissioned by the Governor, with the rank of major, as one of the Board for examining surgeons and assistant surgeons for the Illinois regiments.

Dr. Johnson was much more than simply an eminent physician. He was a magnificent man, possessing a clear, trenchant intellect, and a great and noble heart. His reputation is without spot, and his honor without stain.

He married Miss Margaret Seward, a relative of the New York statesman, William H. Seward. He had two children, of whom only one survived him—Dr. Frank S. Johnson, Professor of Pathology in Chicago Medical College.

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

ALABAMA.—*Mobile*, 40,000 : Reports 47 deaths during February, of which 12 were under five years of age. Annual death-rate, 14.1 per 1000. From zymotic diseases, 5, and from consumption, 10.

CALIFORNIA.—The Governor has appointed the following physicians to serve as a State Board of Health for the ensuing four years. The appointments have been confirmed by the Senate : C. W. Nutting of Siskiyou, *vice* J. M. Brice-land ; C. A. Ruggles, *vice* self ; W. R. Cluness, *vice* self ; W. G. Cochran of Los Angeles, *vice* H. S. Orme ; J. R. Laine, *vice* G. G. Tyrrell ; P. C. Remondino of San Diego, *vice* J. Simpson ; Julius Rosenstirn of San Francisco, *vice* R. Beverly Cole. It had been supposed that only two vacancies existed ; one owing to the resignation of Dr. Simpson, that had been in the Governor's hands for some time, the other, Dr. Tyrrell's expired term. It appears, however, that the ruling in the case of Laine *vs.* Tyrrell also applied here. Drs. Brice-land, Ruggles, Orme, Cluness and Cole were appointed during a recess of the Legislature, and though properly qualifying and being confirmed, they were not recommissioned, and their terms therefore expired over two years ago. No question had ever been raised, the members of the Board serving without compensation, and not meddling with politics, had directed their attention to sanitary matters rather than legal technicalities. It is also noteworthy that the same thing has been going on for many years, and the State Board of Health has often had a number of "term expired" members faithfully serving a parsimonious master.

Mortality reports received for February from eighty-five localities in different parts of the State, with an estimated population of 721,999, give the number of deaths as 1150, representing an annual death-rate of 19.92 per 1000.

The principal zymotic diseases caused 118 deaths, consumption, 167, pneumonia, 160, and bronchitis, 44.

San Francisco, 300,000 : Total deaths, 574. Annual death-rate, 22.9 per 1000.

Sacramento, 30,000 : Total deaths, 43. Annual death-rate, 16.1 per 1000.

Oakland, 60,000 : Total deaths, 66. Annual death-rate, 13.2 per 1000.

Los Angeles, 60,000 : Total deaths, 80. Annual death-rate, 16.00.

CONNECTICUT.—For the month of February the Secretary of the State Board of Health reports 948 deaths in 166 cities and towns aggregating 743,131 inhabitants, showing the temporary annual death-rate for the State to be 15.3 per 1000. The mortality from zymotic diseases was 144, being 15.1 per cent of the total. From consumption there were 124 deaths.

New Haven, 85,830 : Total deaths, 117—26 under five years of age. Annual death-rate, 14.6 per 1000.

Hartford, 53,000 : Total deaths, 96—27 under five years of age. Annual death-rate, 18.8 per 1000.

Bridgeport, 48,740 : Total deaths, 55—20 under five years of age. Annual death-rate, 13.0 per 1000.

Waterbury, 33,180 : Total deaths, 46—9 under five years of age. Annual death-rate, 16.6 per 1000.

DISTRICT OF COLUMBIA, 250,000 : Total deaths in four weeks ending February 28th, 415—145 under five years of age, and 177 in the colored population. Annual death-rate, 21.7 per 1000. From zymotic diseases there were 64 deaths, and from consumption, 52.

FLORIDA.—*Pensacola*, 15,000 : Four weeks ending February 28th. Total deaths, 19. Annual death-rate, 16.45 per 1000.

ILLINOIS.—*Chicago*, 1,200,000 : During the month of February there were 1924 deaths—936 under five years of age, representing an annual death-rate of 19.24 per 1000. From zymotic diseases there were 385 deaths, and from consumption, 173.

IOWA.—*Council Bluffs*, 28,000 : Total deaths during January, 27. Annual death-rate, 10.94 per 1000.

Davenport, 13,715 : Total deaths during January, 35. Annual death-rate, 21.6 per 1000.

Des Moines, 53,000 : Total deaths during January, 67. Annual death-rate, 14.4 per 1000.

LOUISIANA.—*New Orleans*, 254,000 : During the four weeks ending February 28th there were 464 deaths—115 under five years of age and 184 in the colored population. Annual death-rate, 23.55 per 1000. From zymotic diseases there were 44 deaths, and from consumption, 57.

The Auxiliary Sanitary Association is now engaged in constructing public baths, supplied by artesian water from a well 750 feet deep, near the river front of the city. Supplying 750 gallons per minute, at a cost of \$37,000, donated for the purpose by Mr. John A. Morris, President of the Louisiana Lottery Company.

MARYLAND.—*Baltimore*, 455,427 : Reports for the month of February, 702 deaths, of which 250 were under five years of age, and 169 colored. The annual death-rate per 1000 was 18.49.

From zymotic diseases there were 77 deaths, and from consumption there were 102. There were 207 cases of contagious diseases reported.

MASSACHUSETTS.—*Boston*, 448,477 : There were reported during the month of February 735 deaths, of which number 229 were under five years of age. Annual death-rate per 1000, 19.66.

From zymotic diseases there were 63 deaths, and from consumption, 88.

MICHIGAN.—The Secretary of the State Board of Health reports for the month of February, 1891, compared with the preceding month, the reports indicate that dysentery, cerebro-spinal meningitis, cholera infantum, inflammation of brain, measles, inflammation of bowels, and diphtheria increased, and that whooping-cough decreased in prevalence.

Compared with the average for the month of February in the five years, 1886-90, membranous croup, cholera infantum, cholera morbus, influenza, and erysipelas were more preva-

lent, and small-pox, whooping-cough, typho-malarial-fever, and measles were less prevalent in February, 1891.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of February, 1891, at sixty-eight places, scarlet-fever at ninety-three places, typhoid-fever at thirty-two places, and measles at fifty-nine places.

Reports from all sources show diphtheria reported at ten places less, scarlet-fever at eight places less, typhoid-fever at nine places less, and measles at eleven places less in the month of February, 1891, than in the preceding month.

Detroit, 220,000: Reports for February 262 deaths—76 under five years of age. Annual death-rate, 15.52 per 1000. From zymotic diseases there were 44 deaths, and from consumption, 26.

MINNESOTA.—*St. Paul, 150,000*: Reports for February 128 deaths, of which 51 were under five years of age. There were 21 deaths from zymotic diseases, and 8 from consumption. Annual death-rate 10.24 per 1000.

MISSOURI.—*St. Louis, 460,000*: Reports during February 680 deaths, of which 212 were under five years of age. Annual death-rate, 17.73 per 1000. From zymotic diseases there were 87 deaths, and from consumption, 65.

NEW JERSEY.—*Paterson, 78,350*: Reports for the month of February 117 deaths, of which 44 were under five years of age. Annual death-rate, 16.35 per 1000. From zymotic diseases there were 12 deaths, and from consumption, 17.

Hudson County, 292,734: Reports for February 620 deaths, of which 225 were under five years of age. Annual death-rate per 1000, 25.4. From zymotic diseases there were 118 deaths, and from consumption, 74.

NEW YORK.—State Board *Bulletin* not received.

NORTH CAROLINA.—The State Board *Bulletin* summarizes the mortuary statistics of fourteen towns for the month of February, as follows: Population, 42,539 white and 37,682 colored. Total deaths, 96—57 colored and 30 under five

years of age. From zymotic diseases there were 5 deaths, and from consumption, 17.

Wilmington, 21,000 : Total deaths, 35—15 under five years of age. Annual death-rate, 20.0 per 1000.

OHIO.—*Cincinnati*, 300,000 : Reports for February 483 deaths, of which number 146 were under five years of age. Annual death-rate, 19.32 per 1000. From zymotic diseases there were 66 deaths, and from consumption, 70.

Toledo, 82,652 : Reports for the month of February 108 deaths, of which number 48 were under five years of age. The annual death-rate per 1000 was 15.68.

From zymotic diseases there were 17 deaths, and from consumption, 17.

Mansfield, 16,000 : Reports for February 12 deaths, one only of which number was under five years of age. The annual death-rate per 1000 was 9.6. There was but one death from zymotic diseases, and one from consumption.

PENNSYLVANIA.—*Philadelphia*, 1,069,264 : Reports that during the month of February there were 1615 deaths, of which 544 were under five years of age. Annual death-rate, 19.6 per 1000. From zymotic diseases there were 177 deaths, and from consumption, 191.

Pittsburg, 240,000 : Reports 380 deaths during the month of February, of which 152 were under five years of age. Annual death-rate, 19.2 per 1000. There were 63 deaths from zymotic diseases, and 28 from consumption.

RHODE ISLAND.—The number of deaths reported during January was 420, in a population aggregating 314,212. Annual death-rate, 16.0 per 1000. There were 39 deaths from zymotic diseases, and 57 from consumption.

WISCONSIN.—*Milwaukee*, 220,000 : Reports for February 325 deaths, of which 103 were under five years of age. Annual death-rate, 17.73 per 1000. There were 57 deaths from zymotic diseases, and 20 from consumption.

The cases of contagious disease reported to the Health Department during the month were : Scarlatina, 68 ; diphtheria, 160 ; typhoid-fever, 2 ; measles, 3.

LITERARY NOTICES AND NOTES.

NEW YORK STATE COMMISSION IN LUNACY, SECOND ANNUAL REPORT 1890.—A document of three hundred and twenty-five pages, comprising a general sketch of the asylum system, in twenty-five parts, summarizing the number, kind, and costs of hospitals—State and county ; Proper Care, Curability, and Decrease of the Insane ; Private Patients in State Hospitals ; Medical Officers in State Hospitals ; Powers, Duties, Regulations, Orders, Recommendations, etc., and the Results in Tabulated Statistics.

The apparent increase of the insane in the State is accounted for by the increase of population, particularly in populous centres. Comparisons of percentages of increase in the reported number of insane during the past ten years, each year being separately compared with the previous year, show that as between the last and the first five years of the decade there is a decrease in the average percentage of 1.12. This decrease is accounted for by reason of the more intelligent, humane, and skilful treatment which has been furnished in recent years.

The actual number of insane in the State on the first day of October, 1890, as computed in a census taken of all classes, was 16,002, showing an increase during the year, since September 30th, of 529.

The following table is appended as showing the percentage of cures effected in each of the State hospitals, as reported by the medical superintendents thereof, for the year ending October 1st, 1890, estimated upon the average daily population. Properly speaking, the Binghamton and Willard State hospitals at this time should be excluded, for the reason that prior to the passage of the State Care Act, nearly all of their inmates were of the so-called chronic or incurable class, but as refuting the claim of incurability it may be noted that even in these hospitals a certain percentage of cures is reported :

Utica State Hospital, 19.53 ; Buffalo State Hospital, 29.19 ; Middletown State Homœopathic Hospital, 18.16 ; Poughkeepsie State Hospital, 18.00 ; Willard State Hospital, .60 ; Binghamton State Hospital, 1.55 ; State Asylum for Insane Criminals, 3.56 ; average percentage, 12.94.

Heretofore one of the State hospitals (the Middletown State Homœopathic) has incorrectly proclaimed a much higher ratio of recoveries and a much lower ratio of deaths than those of any other hospital, simply by estimating the percentage of recoveries on the number discharged and the percentage of deaths on the whole number treated, methods which, it need scarcely be said, are calculated to show, on the one hand, the highest ratio of cures, and, on the other, the lowest rate of deaths ; whereas, in the other institutions these percentages are very properly estimated on the average daily population.

THE INTERNATIONAL MEDICAL ANNUAL AND PRACTITIONER'S INDEX FOR 1891. Edited by P. W. WILLIAMS, M.D., Secretary of Staff, assisted by a corps of thirty-eight collaborators—European and American—specialists in their several departments. 600 octavo pages. Illustrated. \$2.75. E. B. Treat, Publisher, 5 Cooper Union, New York

The ninth yearly issue of this work is worthy of a place on the table of every medical practitioner. It fully maintains the reputation of the preceding volumes, in the careful selection and condensation of the cream of practical knowledge from all sources during the year. The corps of department editors in number and ability surpasses that of last year. Its numerous illustrations—many of which are in colors—should make the "Annual" more than ever welcome, as providing, at a reasonable outlay, the handiest and best *résumé* of medical progress yet offered.

It is divided into four parts : First, New Remedies, together with a Review of the Therapeutic Progress of the Year. Second, Special Articles on Diagnosis : Deformities of the Hand, and their Diagnostic value in Nerve Lesions ; the Character of the Sputum as an Aid to Diagnosis.

Part third, comprising the major portion of the book : New Treatment, and a retrospect of the year's work, generally, with numerous Original Articles by eminent authorities.

The fourth consists of miscellaneous articles, such as Recent Improvements in Sanitation ; Climatology ; Alcoholic Inebriety, and the results of Asylum Treatment ; Improvements in Pharmacy ; Books of the Year, etc.

The arrangement of the work is alphabetical, and with its

complete index, makes it a reference book of exceptional utility.

In short, the "Annual" is what it claims to be—a recapitulation of the year's progress in medicine, serving to keep the practitioner abreast of the times with reference to the medical literature of the world.

DIABETES : ITS CAUSES, SYMPTOMS, AND TREATMENT.
By CHARLES W. PURDY, M.D., Queen's University ; Honorary Fellow of the Royal College of Physicians and Surgeons, Kingston ; Member of College of Physicians and Surgeons of Ontario ; Author of "Bright's Disease and Allied Affections of the Kidneys;" Member of the Association of American Physicians, of the American Medical Association, of the Chicago Academy of Sciences, of the Illinois State Microscopical Society, etc., etc. 12mo, pp. 192. No. 8 in the Physicians' and Students' Ready Reference Series. Philadelphia and London : F. A. Davis.

The gist of the subject treated appropriately illustrated, and gotten up in the excellent style common to the publisher.

ELECTRICITY : ITS APPLICATION IN MEDICINE AND SURGERY. By WELLINGTON ADAMS, M.D., Author of "Art of Telephony ; by Whom Discovered ;" "Design and Construction of Dynamo-Electric and Electro-Dynamic Machinery ;" Lecturer on Electro-Therapeutics, University Medical College, Kansas City, etc., etc. Vols. I. and II. Paper, 12mo, pp. 113 and 129. Price, 25 cents each. Detroit : George S. Davis.

Concisely written and profusely illustrated. Few works contain so much practical information in so little space, descriptive of electric machinery and its application ; electro-physiology, chemistry, diagnosis, and therapy. Valuable to all practitioners.

THE DAUGHTER : HER HEALTH, EDUCATION, AND WEDLOCK : Homely Suggestions for Mothers and Daughters 12mo, pp. 150. By WILLIAM M. CAPP, M.D. Price, \$1. Philadelphia : F. A. Davis.

A beautifully gotten-up book, replete with the kind of knowledge which all such persons as those for whom it is in-

tended ought to possess; and by its practical application health and happiness may be greatly promoted.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS, No. 3, Vol. IX, for March, 1890, contains three essays of value to all physicians, as follows: Modern Diagnosis of Diseases of the Stomach, by J. M. Purser, M.D., Dublin; Unsoundness of Mind in its Legal and Medical Considerations, J. W. H. Williams, London; Baldness and Grayness—their Etiology, Pathology, and Treatment, by Tom Robinson, M.D., London. \$10 a year; \$1 a number. Wm. Wood & Co., New York.

THE EXPERIMENTS OF DR. KOCH AND DR. TRUDEAU are the subjects of a particularly interesting review, by Dr. MARY PUTNAM JACOBI, in the April *Century*. These experiments, the doctor points out, were guided by the great doctrine of vaccination, which was the starting-point of Pasteur's researches on hydrophobia. The attempt was made, not to cure tubercular disease in animals already affected, but by the inoculation of an attenuated tubercular virus to render them impervious to subsequent inoculations with tubercle.

By slightly varying both the method and its intention Koch's extraordinary results have been obtained. He has made a glycerin extract of a cultivated mass of tubercle bacilli, and presumes to have thus obtained in a concentrated form the poisonous substance whose incessant production enables the living bacillus to destroy the tissue around itself. Injection of this substance into the body of a patient, although at a distance from the seat of the disease, thus intensifies and accelerates the destructive, the necrosing, process going on spontaneously under the influence of the disease.

THE POST-GRADUATE CLINICAL CHARTS, designed for use in hospitals and private practice, gotten up and published by Drs. J. H. LINSLEY and WILLIAM C. BAILEY, New York, are admirably adapted to the purpose. Each book keeps the record of one case eight weeks. If required, the book can be taken apart and new leaves inserted. 20 cents each; \$2 a dozen.

MIRACLES AND MEDICINE is the fruitful subject which Dr. ANDREW D. WHITE will take up next in his Warfare of Science papers in the *Popular Science Monthly*. The May number will contain the first part of this chapter, telling how tales of miraculous cures arose and grew in the Middle Ages, and how the early progress of medical science was hampered by the jealousy of relic-peddlers and theological oracles.

GLIMPSES OF THE BACTERIA, by T. MITCHELL PRUDDEN, M.D., in *Harper's Magazine* for April, is in a style well calculated to interest and enlighten the lay reader on the uppermost topic which now engages the attention of physicians, who may also profit by the lucidity of this excellent contribution to popular literature.

"Little by little we are learning," says Dr. Prudden, "of that which everybody should take heed; that prevention is better than cure, and that prevention is possible in a large number of those diseases which have claimed their victims hitherto unchallenged. People have always taken it as a matter of course that a certain number of persons must sicken and die of such diseases as typhoid-fever and diphtheria; but we know to-day that these diseases can be largely limited if only proper care be taken in destroying the waste material from the sick. We know now to just what we must attribute the widespread acquirement of tuberculosis, and that proper, cleanliness in streets and houses and all assembling places would greatly curtail the number of its victims."

THE COLUMBIAN CYCLOPÆDIA is the new name and new form of what has heretofore been known as Alden's Manifold Cyclopædia, and which has won great popularity by its high merit, combined with its amazingly low price.

The Columbian Cyclopædia will comprise 32 volumes, of about 800 pages each (the Manifold was 40 vols., of 640 pages each), being about equal in size to Appleton's Cyclopædia, and about fifty per cent larger than Johnson's. The entire set will contain about 7000 illustrations; it is very handsomely printed and bound, and, like the Manifold, is almost fabulously cheap, the entire set being furnished in cloth binding for \$25, with easy instalment terms to those who want them. Of course subscriptions to the Manifold

will be completed in uniform style with the early volumes delivered.

Whoever is interested in cyclopædias will do well to secure (free) specimen pages of the Columbian, which may be had by addressing The Columbian Publishing Co., 393 Pearl Street, New York, or 242 Wabash Avenue, Chicago.

GLUE WHICH WILL UNITE EVEN POLISHED STEEL.—A Turkish receipt for a cement used to fasten diamonds and other precious stones to metallic surfaces, and which is said to unite even surfaces of polished steel, although exposed to moisture, is as follows: "Dissolve five or six bits of gum mastic each of about the size of a large pea, in as much spirits of wine as will suffice to render it liquid. In another vessel, dissolve as much isinglass, previously softened in water, as will make a two-ounce vial of strong glue, adding two small bits of gum ammoniac, which must be rubbed until it is dissolved. Then mix the whole with heat. When it is to be used, set the vial in boiling water."

PAMPHLETS, REPRINTS, REPORTS, ETC., RECEIVED.

Dermatological Biography, by George Thomas Jackson, M.D., New York.

Third Annual Report of the Agricultural Experiment Station, Cornell University, Ithaca, N. Y.

Annual Report of the Laws Regulating Medical Practice, by Richard J. Dungleson, A.M., M.D., Philadelphia.

A Study of Sterility, Its Causes and Treatment, by Thomas W. Kay, M.D., Scranton, Pa.

Brooklyn Training School for Nurses. Tenth Annual Report, Brooklyn Hospital, Brooklyn, N. Y.

Deafness as a Result of Nasal and Dental Diseases, by D. H. Goodwillie, M.D., New York.

Nasal Intubation.—*Ibid.*

Action of the Glottis in Singing, by Thomas R. French, M.D., Brooklyn, N. Y.

St. Mary's Hospital Report, 1889, Brooklyn.

The Franklin Interrupted Current, by William James Morton, M.D., New York.

Papilloma of the Vocal Cord, by Charles N. Cox, M.D., Brooklyn, N. Y.

A Death Caused by a Uterine Dilator, by Howard A. Kelly, M.D., Baltimore, Md.

Recent Experience in Operating for the Lacerations of Perineum Involving the Sphincter Ani, by Horace Tracy Hanks, M.D., New York.

Pennsylvania Training School for Feeble-Minded Children. Thirty-eighth Annual Report, 1890, Elwyn, Pa.

Anodal Diffusion as a Therapeutic Agent, by Frederick Peter-son, M.D., New York.

Use and Abuse of Obstetrical Forceps, by Eugene Prosper Bernardy, M.D., Philadelphia, Pa.

Mixed Specimens. Illustrating the Principal Complications and Varieties of Pelvic and Abdominal Surgery, by Joseph Price, M.D., Philadelphia, Pa.

Certain Causes of Major Pelvic Troubles.—*Ibid.*

Surgical Conception of Peritonitis.—*Ibid.*

Intrapulmonary and Subcutaneous Treatment of Tubercu-losis, by John Blake White, M.D., New York.

Stricture Followed by Rupture of the Urethra and Extrava-sation of Urine.—*Ibid.*

Tonic Reconstituents, by A. Lutaud, Paris, France.

Resection of the Optic Nerve, by L. Webster Fox, M.D., Philadelphia, Pa.

Pathology and Treatment of Aggravated Hæmorrhoids, by Lewis S. Pilcher, M.D., Brooklyn, N. Y.

Anthrotomy for Suturing Recent Simple Fractures of the Patella—*Ibid.*

The Rotary Element in Lateral Curvature of the Spine, by A. B. Judson, M.D., of New York.

The Relationship Existing Between Human and Bovine Tu-berculosis.—Coincident Geographical Distribution of Tu-berculosis and Dairy Cattle.—Consanguineous Breeding in its Relation to Scrofula and Tuberculosis, by E. F. Brush, M.D., of Mount Vernon, N. Y.

The Treatment of Morphine Disease, by I. B. Mattison, M.D., Home for Habitues, Brooklyn, N. Y.

The Moral Imbecile, by Dr. I. N. Kerlin, of Elwin, Pa.

Treatment of Catarrh, by J. J. Stephens, M.D., of Clinton, O.

Road Help for the Country Doctor, by S. O. L. Potter, M.D., San Francisco, Cal.

THE SANITARIAN.

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WOOLLEN OR LINEN?

By R. C. RUTHERFORD, New York.

THE truth of the maxim that drowning men catch at straws, can hardly find a better illustration than that afforded by the spasmodic chuckle of the editor of the *Irish Textile Journal* (February 15th, 1891) over the petty crumbs of comfort thrown to him by "a Mr. Milton" in his "advocacy" of Irish linen.

The editor wishes "to direct particular attention to the admirable paper in which Mr. Milton advances further arguments, based upon his lengthened observation and experience, to show that we have in linen the best of all fabrics for health, ease, and satisfaction, not only of the utmost value in all skin diseases, but the most salutary and agreeable of any to make men healthy and to keep them so." And he thinks "the trade is under deep obligation to Mr. Milton for his cordial advocacy of Irish linen." He is sure that Mr. Milton is in a position "to speak with absolute certainty and authority upon such a matter as this, and his opinion outweighs any number of irresponsible and interested arguments preferring other fabrics." (This is the first time we have ever heard of *irresponsible* and *interested* arguments—or of arguments *preferring* anything.) This admirable paper of Mr. Milton has given Belfast her opportunity, and it "only remains for her to make good use of it." "A vigorous assault on the home market should at once be made, and the public invited to consider the benefits and advantages of wearing linen." "Information" must be "spread abroad" "upon our side of the question," and "it will soon become evident how much there is to be done, and,

what is more [!], *how much profit and good business may be gained by doing it.*" [The italics are mine.] This, after that felicitous fling at *interested arguments* is refreshing, perhaps, because "to all intents and purposes the discussion breaks fresh ground."

Inflated with this idea of prospective thrift, the editor breaks out on another page to say that "the pot must be kept a-boiling;" "this subject must not be allowed to rest or drop out of sight if any business benefit is to be derived from it." There must be "persistent application" based on the public gullibility, for, "If constant dropping wears away stones, dogged advertising may invest the bread-crumb pill with amazing virtue;" and "It would be possible by judicious expenditure and vigilant pains [such as 'vigorous assaults on the home market,' 'dogged advertising,' and 'keeping the pot a-boiling'], to make the public believe in linen and buy and wear it, though flax had [have] no more virtue than any other fibre, and flaxen fabrics no more reputation than drugged or shoddy."

However, the editor does not rely wholly upon popular gullibility for his success in popularizing linen. It has merits and "a good name" of its own; and "it can be proved by competent and trustworthy authorities to be healthful, and, when once the wearer is habituated to it, is as grateful and comforting as a familiar cocoa."

Well, then, with these aids in its favor, a public willing to be gulled, and a thing that "has already a good name throughout the length and breadth of the land," what is to hinder its universal adoption for the clothing of the human race?

Why, it is that pesky Jaeger business, and the neglect of "dogged advertising." Hear him again!

"It is only in recent years that linen has lost so much of its good old reputation, [we have just been told that linen has already a good name throughout the length and breadth of the land, a firm foundation in the esteem of every true housewife, and a history to which *no bounds of time can be put*, abounding in picturesque incidents and familiar illustrations, etc.], and this chiefly because the advocates of woollen underwear, outerwear, and woollen all-wear, have belittled linen in order to put their own platform the higher." Aye, there's the rub.

"Take Dr. Jaeger's little book on Health Culture." That is good advice. That is the very thing we should advise every one to do. Take Dr. Jaeger's book, not any one's distorted epitome of it. Take it, and read it, and you will say, with Julian Hawthorne, that "Every man and woman in America ought to read it. Besides a great deal of wise counsel regarding diet, ventilation, and kindred subjects, it shows the high advantages of woollen over other material for clothing, not only as a preservative of health, but as a cure and preventive of many diseases. It is impossible to resist the doctor's arguments, founded as they are on science and practical experiment; and the language in which the essays are written is entirely devoid of technical difficulties, and has a familiar tone which renders the little book intrinsically pleasant reading. The value of the Woollen System in the clothing of children cannot be exaggerated, and those parents who have seen how their children thrive by it, will not be slow in adopting it for themselves."

"By this," our editor, meaning the little book, goes on to say, "We are taught that wool is, among other things, a remedy against [for] corpulence; that it multiplies pleasurable emotions; fortifies the body against infections, and increases the compass of the voice."

Now, let us ask the editor of the *Irish Textile Journal* whether he will say that he thinks Dr. Jaeger wrong in teaching these things? Does he not, in fact, believe every word of it to be true, in the sense and to the extent in which Dr. Jaeger teaches it? Is he willing to stake his reputation for intelligence and honesty on the denial of its truth? Does he not know that whatever promotes the general health, is, *pro tanto*, a specific for any special disease, and a preventive of it; that any weakness lowers the compass of the voice; that a single attack of indigestion depresses the spirits and darkens all the chambers of the soul; and that, with the return of health, come the manly tones, the pleasurable emotions, and *the power to resist infection?* He will not say that he does not know all that; but he would have us think that he doubts the efficacy of wool as a preserver and promoter of the general health. Perhaps he does doubt it; though how he can doubt it after reading Dr. Jaeger's little book, is incomprehensible to us. We admit that Dr. Jaeger has somewhat of the zeal and enthusiasm of the reformer, and we can make a liberal

allowance for a tendency to magnify the results of his labors ; we can do all this, and yet find enough to demonstrate, beyond the shadow of a doubt, the absolute impregnability of his system, the fundamental truth of which is that *wool—a material provided by nature for the clothing of an animal body—is the most suitable material for the clothing of the body of the animal man.* To one that believes in the wisdom of Providence, or in the aptness of Nature to adapt her means to her ends, there is no need of argument to support this foundation fact of the Jaeger System. But our Irish editor makes much of authority. Surgeon Milton and Dr. Purdon are authorities that ought to carry conviction with the force of a cyclone. They are, undoubtedly, good authorities, perhaps the very best respecting the treatment of diseases of the skin. And, so far as we can see, while sticking to their lasts, they say nothing from which Dr. Jaeger would dissent. Nay, one of them frankly *specifies* a point—and that an essential one—of absolute agreement between Dr. Jaeger and himself ; but he does not *specify* any point of disagreement.

But for Dr. Purdon and Surgeon Milton to infer that, because “Irish linen” is a good dressing for nettlerash, everybody ought to wear linen shirts and drawers, is about as rational as it would be to insist that the human race should be clothed in porous plaster underclothing, because a porous plaster is good for rheumatism. That very “lengthened experience” that qualifies Surgeon Milton to speak authoritatively respecting the value of linen applications in eczema and nettlerash, disqualifies him for speaking of its value as a garment for the body in its normal condition. A *divided experience* would have given him a broader view. So completely was his mind absorbed in the one idea, that Dr. Purdon mistook the purport of his (Milton’s) first article, so far as to suppose that Surgeon Milton “meant to convey the impression that eczema is the one and only disease of the skin which calls for the use of Irish linen.” And there is nothing in Mr. Milton’s second “admirable paper,” with any experience to back it, except a correction of Dr. Purdon’s error, and an attempt to show that Irish linen is a better dressing than wool for *all* diseases of the skin. Now, if authority is what the Irish editor wants, we can offer him some worthy of his most serious consideration.

The one man in all the ages that contributed the most to experimental science, undertook to ascertain by the most precise and elaborate experiments, which, of all the materials used for human clothing, is the best adapted to the purpose, with reference to the various and vitally important functions of the human skin. The results were, in some respects, a reversal of a previous judgment, and of so far-reaching consequence that, in full view of his vast and manifold scientific discoveries, he pronounced those experiments by far the most important ones he had ever made.

This is the language of the illustrious COUNT RUMFORD, given to the world nearly a hundred years ago. Here is a witness worth attending to. We quote a few passages from his works :

" Woollen clothes greatly promote insensible perspiration, owing to the strong attraction which subsists between wool and watery vapor which is continually issuing from the human body." It is " evidently not due to the warmth of the covering, for the same degree of warmth produced by more clothing of a different kind does not produce the same effect.

" The perspiration of the human body being absorbed by a covering of flannel, it is immediately distributed through the whole thickness of the substance, and by that means exposed by a very large surface to be carried off by the atmosphere ; and the loss of this watery vapor, which the flannel sustains on the one side, by evaporation, being immediately restored from the other, in consequence of the strong attraction between the flannel and this vapor, the pores of the skin are disengaged, and they are continually surrounded by a dry, warm, and salubrious atmosphere.

" I am astonished that the custom of wearing flannel next the skin should not have prevailed more universally. I am confident it would prevent a multitude of diseases ; and I know of no greater luxury than the comfortable sensation which arises from wearing it, especially after one is a little accustomed to it.

" It is a mistaken notion that it is too warm a clothing for summer. I have worn it in the hottest climates, and in all seasons of the year, and never found the least inconvenience from it. It is the warm bath of a perspiration confined by a linen shirt, wet with sweat, which renders the summer heats of the tropical climates so insupportable ; but flannel promotes perspiration and favors its evaporation ; and evaporation, as is well known, produces positive cold.

"I first began to wear flannel, not from any knowledge which I had of its properties, but merely upon the recommendation of a very eminent physician; (Sir Richard Jebb;) and when I began the experiments of which I have here given an account, I little thought of discovering the physical cause of the good effects which I had experienced from it; nor had I the most distant idea of mentioning the circumstance.

"I shall be happy, however, if what I have said or done upon the subject should induce others to make a trial of what I have so long experienced with the greatest advantage, and which I am confident they will find to contribute greatly to health, and consequently to all the other comforts and enjoyments of life.

"I shall then think these experiments, trifling as they may appear, by far the most important ones I have ever made."

We now give a few passages from the "Editor's Table" of THE SANITARIAN for September, 1886, edited by the well-known physician and scientist, A. N. BELL, A.M., M.D., of New York:

"It is remarkable with regard to clothing, that at the present time there appears to be a general tendency to exercise the preference for the kind of material which is identified with the earliest history of mankind. Indeed, the only garment worn by the pre-historic man was, as it is even at the present day by some savage tribes, *woollen*—the wool-covered animal skin, and, apparently, without regard to climate. The transition from this to the textile fabrics made of the wool of the sheep took place at a very early period, and long before the use of any other material for the same purpose; insomuch, indeed, as to have been of almost universal use among the most advanced nations. Royal robes, head-dresses, and mantles of the finest wool; and tent-coverings, carpets, and curtains of heavier texture were exclusively manufactured of wool by the Asiatics, in such profusion that for many ages flannel appears to have been the only textile in use. The kingly robes of all the Oriental nations, and the imperial purple of Rome, were all of pure wool colored with Tyrian dyes, whose perfect beauty, after being lost to art for ages, has been reproduced in our day by the superb aniline dyes, and woollen garments are now manufactured with an exquisiteness of texture, finish, and color, unsurpassed by any other fabric. This is the more interesting when viewed in its hygienic aspect.

"Wool has long since been demonstrated to be a bad conductor of heat and a powerful absorber of moisture.

"Pettenkofer, a few years ago (*Zt. fuer Biol.* band. i. p. 185) made a series of interesting experiments, demonstrating

the hygroscopic power of wool compared with linen. He showed that linen not only absorbs much less water, but parts with it much more quickly.

"The porosity of clothing—that is, the facility with which air passes through it, is also a point of much importance; and this, too, shows the great advantage of flannel clothing.

"The most important element is the extraordinary degree of absorptivity of flannel, and this property it is which, above all others, gives flannel its superiority over all other fabrics as an article of clothing.

"Perspiration, sensible or insensible, is at all times necessary to maintain the equable temperature of the body; but during exercise, when perspiration is active and to such a degree as, when the exercise ceases, to chill the body without the interposition of such clothing as will maintain due warmth despite the evaporation from the surface, woollen clothing demonstrates its superiority.

"Exposed to perspiration, the moisture penetrates the wool fibres, distends and lies between them, insomuch that the amount of water absorbed and held by hygroscopic absorption into and between the fibres may be more than equal to the weight of the wool. By absorbing the perspiration as fast as it is emitted, and, if unrestrained by impervious overclothing, allowing it to pass off into the atmosphere almost as fast as it accumulates; insensibly, the skin is kept dry, and an equable temperature of the body maintained not only during the process of active perspiration, but subsequently, and by this means, chill is prevented.

"On the other hand, if active exercise be taken in linen or cotton shirts, and perspiration be induced as in the former case, the moisture, instead of being absorbed and allowed to pass off into the atmosphere, clings to and saturates the texture, which sticks to the skin, clogs the pores, and, on leaving off exercise, so rapidly cools the surface by the loss of heat as to induce chill and disease.

"Moreover, flannel acts as a gentle stimulus to the skin, and thereby exercises a highly beneficial influence in removing the scurf, keeping the pores open and clean, and promoting its healthy action.

"These differences make it plain why woollen clothing is alike superior to other material in both cold and hot weather—it meets and modifies the effects of the variable conditions of exercise and temperature.

"Flannels are now manufactured in all degrees of thickness and weight, and can therefore be chosen with special reference to climate and occasion.

"The objections raised against the use of flannel are for the most part founded on ignorance of its advantages, prejudice,

obstinacy, and bravado, which it is the object of this notice to correct."

The following paragraph is quoted from *Diseases of the Nose and Throat* (pp. 63-64), by F. H. BOSWORTH, M.D., Professor of Diseases of the Throat, Bellevue Hospital Medical College, New York, a universally recognized authority on the subject upon which he writes :

"The selection of the proper fabric to be worn next the skin is too often dictated by a consideration of luxury rather than of health. The most important function that goes on in the skin is that by which the body is kept at an equable temperature by means of perspiration. Theoretically, this is accomplished by means of an insensible perspiration, and practically, too, except under extraordinary circumstances, when the perspiration becomes profuse. Now this function of perspiration, or heat radiation, takes place best when the fabric next the skin is a thoroughly porous one. We have no fabric comparable to pure wool in this respect, the virtues of this fabric being, I take it, due to the fact that wool-fibre is highly elastic, and also curls upon itself in such a way as that, when converted into thread and woven into a garment, it still affords a highly elastic and porous textile fabric, which best admits of the escape of heat. Silk probably would never be worn as underwear were it not for the fact that it is the most expensive of fabrics. From a sanitary point of view its use is very objectionable, in that cutaneous transpiration is interfered with. The same is true of cotton and linen, in that their fibre is perfectly straight, and is also inelastic. A textile fabric manufactured from material of this character is denser and less porous than one made from the kinky wool fibre. Hence the latter furnishes us with a material for underwear which in the least degree interferes with the important function of the skin above alluded to. As regards the heat-conducting properties of these different materials, this I regard as a matter of little moment, as compared with the far greater importance of wearing next to the skin a thoroughly porous and elastic fibre."

Another witness of unquestionable credibility, speaking from personal experience—the Rev. Dr. HENRY W. FIELD, an extensive traveller, the author of many books, and the editor of the New York *Evangelist*—in the editorial columns of his paper, (September 23d, 1886,) writing of the Jaeger woollens, says :

"We have inspected these woollen garments with sharp eyes

and a somewhat sceptical mind. Subjecting them to the test of touch, we have found them soft as silk, causing none of the irritation of the ordinary heavy clothing. We have worn them next to the skin and found, somewhat to our surprise, that instead of an oppressive warmth, the sensation was one of delicious coolness and comfort. The reason is obvious : the moisture from the pores is *absorbed*, so that the body, instead of being kept in a constant steam, as in a Turkish bath, is preserved at a normal temperature."

Again, the same writer, in an editorial of the *Evangelist*, (April 12th, 1888,) says :

" It is more than a year since we began to make a trial of their garments, and in that time have put them to the test of many countries and climates, wearing them on land and sea, in the fogs and mists of England, on the Mediterranean, and among the mountains of Northern Africa. During all this time we have not had a chill—we might almost say a shiver. Even in the late blizzard we tramped through snow-drifts unharmed, cased from head to foot in garments that protected us perfectly from the bitter cold. But now that the winter is over and gone, and that we begin to feel the gentle warmth of spring, these woollen garments seem a little too heavy for the season, and we feel the need of something lighter and cooler. But at this moment Dr. Jaeger comes out with a new improvement of his wonderful clothing, in which the fine wool is spun out to a thinness and delicacy that gives it a feathery lightness, till it looks like gauze. If of Lisle thread, it could not be cooler, and yet, owing to the texture being of wool, (they will have nothing which is not of the finest wool,) this delicate fabric absorbs perspiration, while garments that do *not* absorb it remain damp, and with a sudden change of temperature become clammy, exposing the wearer to the danger of a severe cold. But here is a fabric so finely wrought that it seems to unite the best properties of several materials used for underclothing—to be at once warm enough for the season, and yet cool as the finest linen and soft as silk. Could the refinement of luxury farther go ? "

And again, September 27th, 1888, the doctor expresses himself as follows :

" Since the introduction of the Jaeger woollen garments into this country, the sale has so rapidly increased that one cannot go to any of our fashionable watering-places—to the mountains or the seashore—without hearing the merits of this clothing as a protection against colds, and the whole brood of diseases that spring from that one source."

We give also a few extracts from an article by Dr. WILLIAM JEFFERSON GUERNSEY, in the *Homeopathic Physician*, Philadelphia, November, 1886 :

" Several years ago, Dr. Ad. Fellger, after returning from a trip abroad, exhibited to me some articles of clothing manufactured under the Jaeger Sanitary Woollen System, which he had obtained at Stuttgart, where he also had the pleasure of meeting the inventor. The 'feel' of the exquisitely fine fabric created within me an instantaneous craving for just such clothing. Could it be procured in this country, and at a reasonable price? Having long been cognizant of the great superiority of woollen over vegetable clothing, I felt that in this system of using *solely* one hundred per cent woollen material for day and night wear Dr. Jaeger had 'hit my fancy to a T.' A few weeks since a circular was sent me from the Jaeger Sanitary Woollen System Company, of 827 and 829 Broadway, New York, which proved to be an American branch of the Stuttgart concern. I accordingly availed myself of a little pleasure trip to Gotham, 'taking in' the Jaeger store. The result of my inspection of an hour and a half was an empty pocket (which was too lightly charged) and a determination to some time be possessor of an entire line of the goods.

" Although the temperature was rising, I had faith enough in the theory (which I will presently explain) to immediately don my woollen undersuit, and could not now be prevailed upon to part with it."

He then gives a synopsis of the Jaeger theory, and adds :

" There is a fond notion in the minds of most people that woollen goods are hot and good only for winter, and even then apt to engender too copious a perspiration. Now let me here state that it is solely with a hope of reaching a few, whom Dr. Jaeger will not, that I have been tempted to here defend his theory—namely, that woollen underclothing are hot in summer because they are encased in linen or cotton ones which prevent the evaporation that would otherwise take place, and they are not warm enough in winter, sometimes for the same reason. If, therefore, the evaporation be permitted to take place uninterrupted, or unhindered by this 'varnish,' we have a healthy skin, normal circulation, and consequently sufficient heat to withstand the cold of winter and feel comfortably cool in summer. Vegetable fabrics are more or less good conductors of heat and cold. Wool is a non-conductor of both, and thereby insulates the body from atmospheric changes. With such a system of clothing, which is veritably a sanitary one, we may safely, even though our clothing be somewhat damp from rain or perspiration, subject ourselves to an abundance

of open air, and with absence of drug dosing, which homœopathy forbids, nature may be kind to us in extending our present period of ill health to robust manhood and womanhood far beyond the 'expectancy' table of the best regulated life insurance company. Homœopathy does not force and drive, but aids nature in casting off disease by coaxing it to perform its *normal functions*. So does the sanitary woollen system assist in maintaining health by keeping up the functions of nature. Therefore, I say, what homœopathy is to the sick, the Jaeger system is to the well, and as a natural health preserver (consequently a preventive of disease) and an auxiliary in treating the sick, we should urge its general adoption, and do all in our power as scientific physicians to discourage the use of the pernicious vegetable clothing."

The following is taken from the *New York World*, August 2d, 1887 :

"To the Editor of the *World*:

"If experience counts, here is mine. For over twenty years I have worn the ordinary loose flannel shirts for comfort and health; linen dickey, collar, and cuffs for weak-minded concession to appearances, and never an undershirt. Same in winter as in summer. Results, never a serious cold or illness, ability to do a ten-mile average walk daily the year round, (last Monday, the day of thirty-four deaths from heat, I walked in New York from 11 to 3, say twelve miles, safe and sound, and the like in winter,) and often I have walked for pleasure from forty to fifty-two miles a day in England. To me a skin-tight undershirt with a cotton shroud atop would mean lunacy or bad health—probably both. It explains much of asylum statistical lore. But common-sense diet goes far to back up the clothing, whereby hangs a tale each should read for himself.

PLAIN ENGLISHMAN."

From the *Medical Record*, January 15th, 1887, New York, we quote the two following paragraphs :

"There is no doubt that wool stands at the head of the materials out of which clothing is made. Its virtues depend upon its being a poor conductor of heat; its porosity, allowing the passage of the exhalations from the skin; its power of absorbing moisture and giving it up slowly and gradually.

"As a non-conductor of heat, woollen materials have been shown by exact experiments to rank first, although with them must be placed certain furs and the down of birds. After these come silk and cotton, while linen ranks last."

Respecting the claim of Dr. Jaeger, that wool "fortifies the body against infections," our editor evinces some in-

credulity, and, as already noted, quotes a Dr. Meyer as having "adopted" it as the best material in which to "generate germs of fermentation," leaving the reader to infer as much as he pleases about the germs of disease. Touching this point we appeal again to our high authority, Dr. BELL, of THE SANITARIAN. In 1889, nearly three years after the publication of the matter already cited from his pages, he published the following correspondence :

THE RÔLE OF INFECTIVE MICROBES AND THE ADVANTAGES
OF WOOLLEN CLOTHING.

NEW YORK, January 5, 1891.

Editor of THE SANITARIAN:

Two subjects have been themes of especial interest to me for the last two years, to wit : the rôle of microbes in disease, and the Dr. Jaeger theory of sanitary clothing. For this reason, as well as others, I have read with peculiar interest your article entitled "Some Observations on Yellow-Fever and its Habitudes," in the December number of THE SANITARIAN.

On page 505 you say : "Impatient at the continued delay and increasing prevalence of the disease, the writer took the responsibility of having every person on board the Delaware, except necessary keepers, washed and dressed in *new flannel suits*, (sailors' shirts and pants,) procured for the purpose, and transferred to the hospital, where he provided them quarters, and *from that time there was not another case of fever among them*, though there were five cases on the day before. So much for *elimination* as against development under changed conditions."

Of course, such an assumption of responsibility was not without scientific grounds, or the warrant of some precedent. Will you permit an earnest student to ask what those grounds were, and what the *rationale* of the preventive efficacy of the flannel clothing ?

Respectfully yours,

R. C. RUTHERFORD.

"*The Rôle of Infective Microbes* is to battle with the physiological powers of the system which they enter, and to put it upon the defensive immediately that they are distributed to the tissues of the body by means of the blood, which carries them to every part. If the system they enter be weak from any cause, constitutionally so, or feeble from recent disease ; by reason of unhealthful surroundings, such as a foul atmosphere, sudden exposure to excessive heat or cold without sufficient protection ; deprivation of sleep ; deranged diges-

tion, or mental disturbance ; above all, by debauch ; in short, if by anything which disturbs bodily vigor, the microbes have the advantage—and they never fail to avail themselves of it—and generally overcome the power of resistance. It is not because they are cowards and only attack the weak ; they attack the strong and the weak alike on every opportunity, but the strong—with all the functions of the body maintained in a state of vigorous health—are able to cope with the microbes and overcome them. The feeble, on the other hand, are taken at a disadvantage, and the more if the circumstances of their enfeeblement are in any degree maintained.

"' The future of preventive medicine,' said Professor Ray Lankester, in a lecture which he delivered at the London institution recently, ' is the education of the white blood corpuscle.' A corpuscle is a minute cell of protoplasm which floats in the human blood. ' This minute creature eats, and lives, and flourishes, and dies almost like a human being. Its special function,' said the lecturer, ' is to eat up the poisonous element which finds its way into the blood.' When a wound heals it is because these indefatigable corpuscles have found their way to the sore and have eaten away the injured part. When bacteria get into the system the duty of the corpuscles is to go for them and eat them up. If they succeed the patient recovers. If they are out of appetite, or the bacteria too tough a morsel for them to attack, the patient dies. Sometimes, with unconscious heroism worthy of Marcus Curtius, they purify the bodies in which they live by eating up poisonous particles and then ejecting themselves, thus sacrificing their own lives. But such heroic self-immolation is not necessary, if you educate your corpuscle. His education proceeds by inoculation. By accustoming your protoplasmic cell to a low diet of mildly poisonous matter, such as the vaccine lymph, it becomes acclimatized, as it were, and is strong enough to eat up without inconvenience the germs of small-pox, which would otherwise prove fatal. It is these invaluable corpuscles which enable confirmed arsenic eaters to swallow with impunity a dose sufficient to kill six ordinary men.' Professor Lankester is of the opinion that they can be trained so as to digest the most virulent poisons and deal with a great number of diseases.

" With the foregoing suggestions, it is apparent that the indications in dealing with the microbe (infectious disease) are to strengthen the power of resistance to and combat with it in conjunction with the use of every available means of preventing and destroying the conditions favorable to its existence both within and without the human body.

" The conditions most favorable to the propagation of yellow-fever, as also of other infectious diseases, were painfully

familiar to us long before the event referred to ; and not to have applied the best means of resisting it with which we were acquainted, under the circumstances, would have been criminal negligence.

“ *Woollen Clothing* is so well known as the best possible means of protecting the wearer against the ill effects of sudden changes of temperature ; of preserving the equable temperature of the body while it admits of thorough ventilation of the surface with the least risk from exposure ; as a means of absorbing perspiration as fast as it is emitted, and, if unrestrained by overclothing of other material, allowing the perspiration to pass off into the atmosphere insensibly, almost as fast as it is generated, and thus keeping the skin dry even in the hottest weather, and warm in the coldest ; and as a gentle stimulus to the skin, removing scurf, keeping the pores open and clean, and promoting its healthy action for the promotion of health or the elimination of disease ; for all these reasons—and more might be cited—woollen clothing commended itself to us on the occasion referred to, as it has on many other occasions more or less similar, where it has before been *neglected*, and by this we mean as the most healthful apparel for the strong and well, as well as for the sick and feeble, under all circumstances—it invigorates the white corpuscles.”

We give a few passages from the pen of another distinguished traveller and writer, the Rev. Dr. CHARLES H. STODDARD, editor of the *New York Observer*. From an article on SUMMER CLOTHING, in the *Observer*, April 12th, 1888, we make the following extract :

“ *Summer Clothing*.—The summer is drawing near, and many persons are already thinking of their clothes. Just here a great mistake is often made by those who imagine that linen and cotton are cooler materials than wool. The fact is that woollen fabrics, which allow the free passage of air, and which do not get wet and clammy with perspiration, are by far the safest and also the coolest articles for summer wear. In Oriental countries the Arab who would best protect himself adopts the wool from sheep and fine camel’s hair for his clothing and covering, and finds that he is warm amid the snows of Lebanon, and cool in the deserts of El Arish.”

March 28th, 1889, writing of the Jaeger woollens, Dr. STODDARD says :

“ We have had frequent occasion to call attention to the excellent fabrics of the Jaeger Sanitary Woollen System Co.

Having personally worn their articles throughout the different seasons of the year, and in most of the climates of the world, it is a great pleasure to be able to testify to the comfort and safety which these garments insure. They keep the body warm in cold weather without overloading it, and in the hottest day there is no sense of oppression so commonly experienced in the use of other woollen garments. One reason for this is to be found in the excellent quality of the wool. Another reason is that the fabrics are entirely of wool instead of being mixed with other material."

After an experience of nearly four years, he gives this additional testimony, *New York Observer*, June 19th, 1890 :

" *Stanley and Jaeger.*—We are not in the least surprised at the testimony (published in another column of this number of the *Observer*) of the just now most talked of man in the world, Henry M. Stanley, ' testifying to the excellence of the Jaeger clothing.' We were one of the first to examine and test these improved woollen fabrics, and to commend them to our readers. An experience of nearly four years has served but to attest the correctness of our first judgment. We have worn them in all sorts and conditions of weather, summer and winter, and always with comfort and benefit. And now, after that daring and hardy explorer, Henry M. Stanley, has put them to the crucial test of the swamps and broiling sun of Africa, with the result of so emphatic a verdict, the case may as well be regarded as closed in favor of the Jaeger Sanitary Woollen System. It is with an assurance that we are doing our readers a friendly service that we recommend to them the adoption of the Jaeger System of underwear."

As late as April 9th of the current year the *Christian at Work*, which, with the *Evangelist* and *Observer*, makes three of the leading religious papers in the United States, contains the following tribute to woollen clothing, by the editor, J. N. HALLOCK :

" I was delighted during my late trip to the Old World to notice the general use of Dr. Jaeger's excellent ' Sanitary Woollen Clothing' throughout Europe, especially in England and Germany, where I observed it more particularly. I have worn it myself almost exclusively for four or five years, and find it equally desirable in the heat of summer or the cold of winter. In sudden changes of climate, especially, there is nothing like it. It seems to have the peculiar property of not only keeping the skin warm and moist at all times, but in some

manner unaccountable to me, it absorbs all the superabundant moisture, and there is really nothing equal to it. I should not feel that I could cross the ocean in safety or comfort without it. At Ems, Weisbaden, and Heidelberg I found very many of the wealthier class were wearing these goods, and I have yet to hear the first word of complaint. All are delighted with, and regard these garments as natural clothing best adapted for fulfilling the health-sustaining conditions required by the human body. We are apt to think of the Germans as phlegmatic and behind the age in some things, but in this matter of sanitary clothing Germany is as far ahead of America as she is in music. Dr. Jaeger is conferring no small benefit upon our country in introducing these wonderful life-preserving fabrics into the American market. They need only to be worn to be appreciated and used ever after by any person of ordinary intelligence."

NEW YORK.

"J. N. HALLOCK."

The attempt of our Irish editor to make it appear that the Jaeger System discountenances cleanliness, or "discourages washing," is hardly creditable to his shrewdness or candor. It does not require an over-acute faculty of discernment to distinguish between a total renunciation of soap and water and a suggestion of the possibility of "washing too often." Nor does it evince a superior knowledge of the subject to profess to believe that a woollen garment should be washed as often as a linen one, other conditions being equal. There is such a thing as over-bathing. There is also such a thing as too frequently washing woollen underwear. And we venture the assertion that a linen shirt is a better qualified candidate for the wash-tub at the end of a day's wear than a woollen shirt at the end of four days. Try it, Mr. Editor. Wear woollen and wash *yourself*, and you will be surprised to see how long your flannels will keep clean. This is really a strong point in the Jaeger system. Twice the excess of the cost of a flannel over a linen or cotton shirt can be saved in washing the former before it is worn out.

"But," says our editor, "it is a part of our case that wool is by no means beneficial to health."

In support of this absurd proposition, we are told that, "It [wool] has quite lately been adopted by a Dr. Ludwig Meyer, of Stuttgart, as the best material in which to generate the germs of fermentation, to be used instead of yeast, which is

not flattering to its value for clothing; while the opinions of sanitary authorities in cases where epidemics have to be met by quarantine regulations are far from favorable to wool."

It is hardly necessary to comment upon such an essay at argument as this. It is enough to point out the discredit cast upon the whole of it by the unwarranted assertion that wool or any other material can generate germs of fermentation.

We quote another passage as a further indication of the straits to which the editor is driven in his attempts to make out a case.

"But, as a matter of personal health and convenience, the condemnation of wool by professional men is complete, *even if doctors differ about it* as much as on any other known subject."

How can the condemnation be *complete* while the doctors differ about it? How, in the face of the authorities we have cited, can the editor make such an assertion without confessing his ignorance of them? And to speak in ignorance on a theme involving health, happiness, and life, is little if any less than a crime. One may well ask, can disingenuousness further go? We will show you that it can. Immediately following the article we have been considering, is an extract from Dr. SHOEMAKER's book, (the very title to which our editor fails to give correctly,) entitled, "Heredity, Health, and Personal Beauty." The heading to the extract is: "Medical Testimony in Favor of Linen."

Then the editor says:

"Dr. Shoemaker, of Philadelphia, United States, thus writes in 'Hereditary Health, and Personal Beauty': 'Nothing is more delightful for hot weather than linen sheets. Here the quality of linen, in being a good conductor of heat, serves well the heat-oppressed sleeper, conducting as it does the heat so rapidly from the surface of the body as to make radiation back to it inappreciable. Besides, the fibre of linen is round and smooth, rendering fabrics made of it singularly agreeable to the touch when coolness is desirable. An analogous though opposite gratification to that afforded from touching or seeing good blankets in the winter time is experienced from seeing and feeling linen sheets in the summer.'"

Dr. SHOEMAKER is no "crank." His quick eye for genu-

ine merit, his fine discrimination, his clear and vigorous style, his candor and fairness, make him an authority entitled to the highest consideration. Our editor has quoted Dr. SHOEMAKER correctly, and not a word is to be abated from all the doctor says about linen. The trouble lies in the fact that our editor does not quote enough. On the same page with the Irish editor's extract from Dr. SHOEMAKER'S book, (page 384,) and immediately preceding that extract, is the following paragraph :

"Linen is not a good fabric for underwear, even in a hot climate, because linen is a good conductor of heat, presenting conditions just the opposite of those that are best suited for the purpose of clothing, those which are secured by materials that are bad conductors. Linen, besides, readily absorbs the moisture of the body, which circumstance still further promotes the loss of bodily heat in a cold climate, or in a warm climate, facilitates the passage inward of the excessive outside heat. This objectionableness of linen for underclothing, inherent in the physical constitution of the substance itself, we can obviate, when desirable, by wearing a garment under the linen composed of a material that is a bad conductor; but then, it will be observed, the linen has ceased to be an undergarment. With nothing but a single thickness of linen next the skin, a sudden drop of the outside temperature will cause a chill to strike to the very marrow. This is because the heat of the body passes readily through the slight opposition of the fabric, so good is it as a conductor of heat. We once tried to wear linen shirts in very hot weather, but found them, in alternations of temperature, far from agreeable."

"On the contrary," the doctor continues, "nothing is more delightful for hot weather than are linen sheets," with the rest as quoted by our Irish editor.

The reader will notice that the significant and suggestive "On the contrary" is omitted from the extract in the *Irish Textile Journal*.

The paragraph immediately following the "extract" reads thus :

"Taking it for all in all, wool is the best fabric for wear next the skin. But this cannot be said without the qualification that much depends upon the quality of the wool. We have a lively recollection of a terrible cold walk that we once took, with snow on the ground, through the open country,

when, coming to a wayside store, it occurred to us to buy a pair of long, coarse woollen stockings for protection from the severe cold. Such was the exacerbation to the skin from the rude material of the stockings, that by nightfall our legs were covered from ankle to knee with a profuse eruption, which subsided at once as soon as the active cause of the irritation was removed."

Then the doctor adds, finally : " In heat-retaining and excluding merits, the common materials for clothing rank as follows : woollen, cotton, silk. We have said sufficient on the score of linen."

He then speaks highly of linen for *outside* garments in hot weather.

Now, is it reasonable to suppose that the editor of the *Irish Textile Journal* could have picked out his extract from between the two others we have quoted without seeing them, eager as he was on the hunt for " Medical Testimony in Favor of linen ?" Could he have overlooked them ? Did he tell us the whole truth ? Did he find it necessary to misstate the " testimony " directly or indirectly by the *suppressio veri* of the witness brought into court by himself ? Has he misrepresented and insulted DR. SHOEMAKER by giving out that he has given medical testimony in favor of linen, in the face of his unqualified condemnation of it for the uses contemplated in the article of the Irish editor ? Or is he, the editor, acting the part of the unscrupulous attorney for the Irish linen manufacturers, because " it is a matter of the first importance to Belfast ?" These are questions to be asked. It is for the editor of the *Irish Textile Journal* to answer.

It is now in order to offer a few words respecting that " admirable paper " of Mr. Milton's. It is unfortunate that, in all the arguments that Surgeon MILTON urges in favor of linen, the interests of the Belfast manufacturers are so conspicuously prominent. To aid the fabricators of linen to get their goods on the market in successful competition with the goods of the " Jaeger Sanitary Woollen System," which seems to threaten the very existence of the cotton and linen industries, seems to Surgeon MILTON to be of infinitely more importance than the welfare of mankind in general. While he explicitly yields assent to one of the essential features of Dr. JAEGER'S sys-

tem, he would have us infer that, as a whole, he is pitted against it, chiefly by inveighing against the "coarse," "heavy," "huge mass" of woollen clothes which Dr. JAEGER condemns, quite as emphatically as Surgeon MILTON does. And yet, even in this, the zeal of the advocate is manifest in his impetuous overdoing of his task. We venture to say that he has never found in all his paraded long experience, a single person that could honestly sit for the picture he has drawn. His fancied model is of one who "proceeds to don a thick, coarse woollen jersey, or a flannel shirt almost as thick as coarse," "even undyed flannel rendered harsh and stiff by frequent washing;" "coarse woollen jerseys" that might be the "lineal descendants of the hair shirts worn by the penitents of bygone days;" "huge woollen socks and drawers" and "elephantine articles of dress," and then, in the presence of this hideous fancy-graph, he pronounces "the system an imposture."

True, he does not say what system, as he might have said, with credit to his candor, but you are quite at liberty to infer (for anything he says to the contrary) that it is the Jaeger system, although a more preposterous caricature of that system is utterly inconceivable.

Any one that has had the merest glance at the light, fine, soft, smooth, silky, and elastic Jaeger underwear, cannot fail to be struck with the impertinence, the flagrant disingenuousness of Surgeon Milton's tirade, in connection with Dr. Jaeger's name, against the thick, coarse flannels and Jersey woollens to which he imputes so much capacity for mischief. There is no intelligent advocate of all-wool underwear who would not agree with him on this point.

And, finally, the unskilful attorney gives both his case and himself away in these significant words, more significant, we incline to think, than the distinguished surgeon intended them to be: "If only linen next the skin could be combined with light wool yielding sufficient warmth, we should have the nearest approach to hygienic perfection of material that has yet been seen."

Awkward, ambiguous, and unscientific as the sentence is, it contains a confession of the inadequacy of linen as a material for underclothing on a most vital point—its unfitness to pre-

vent the radiation of animal heat. No kind of clothing fabric "yields warmth." It preserves the natural warmth of the body in proportion to its non-conductivity to heat—a property in which wool excels all other clothing materials.

"If only linen next the skin could be combined with light wool yielding sufficient warmth" is not a very lucid collocation of words, but it means, if it means anything, that, if we could combine linen and wool in such a way as to have the linen constituent next the skin and the wool next the linen, and so secure the cooling effects of the linen with the warmth-preserving properties of the wool, we should have the nearest approach to hygienic perfection of [clothing] material that has yet been seen.

Undoubtedly, if! But since that is impossible; and since the woollen garment is deteriorated in exact proportion to the quantity of vegetable fibre mixed with it, linen or cotton, what a relief to Surgeon MILTON it must be, so far as his patients are concerned—what a grief, so far as the Belfast manufacturers are concerned—to be informed that Nature clothes her creatures in a material combining precisely the very qualities that he desiderates in a compound product of linen and wool! And, if Surgeon MILTON would extend his researches beyond the mysteries of eczema and nettlerash, and the Belfast linen factories, to the realms of a sheep's back, he would discover, to his great amazement, the very information of which he seems to be so much in need—namely, that that sheep's back is clothed in wool and not in linen or cotton. And he would be likely to recognize the fact as going far to show that Nature, in producing a material for the clothing of an animal body, had an eye to her business, and did not deem it necessary to consult Senior Surgeon Milton or the Belfast linen manufacturers.

The only assertion of Surgeon Milton's that has the backing of any fact of his long experience, is that linen is a better dressing for skin diseases than cotton or wool, or for wear next the skin by persons predisposed to such affections. He does not, however, hesitate to say that "if people will persist in wearing such things," [the thick, coarse, harsh, and stiff flannels and jerseys previously named,] it is pretty good evidence "that they have got chill on the brain." "For, painful as

it may be to make the statement, they are laboring under a complete delusion, wasting money and endurance on a mere chimera ; the system is an imposture, for the elephantine articles of dress no more protect the wearer from a chill than does the ponderous overcoat. Moreover, dress of this kind, while it oppresses the frame does not at all ward off cold in proportion to the weight of it. We are constantly told that a season such as we have just gone through seriously increases the mortality among the old and infirm, the consumptive and bronchitic ; undoubtedly, but it also carries off plenty of men whose habitual wear is an outfit of the much-vaunted woollen, on the top of which is piled a thick suit of thick clothes, and on the top of this a greatcoat not improbably thirteen or fourteen pounds' weight."

Now, because the practice of thus " oppressing the frame with a huge mass of clothes neither secures the necessary warmth nor wards off congestion," etc., " it is only fair to assume that there must be a flaw somewhere in the chill and flannel theory."

Whose chill and flannel theory ? Why, Dr. Jaeger's, of course. Why, of course ? Because the Jaeger name is the only one mentioned by Surgeon Milton, and there does not happen to be any other chill-and-flannel theory, at the present time, attracting much public attention. And yet, Mr. Milton does not mean Dr. Jaeger, for it is precisely on this point where he is in perfect accord with the famous German doctor. Hear him : " Those to whom warmth may happen to be essential, owing to bad health, necessity for travelling, and so on, cannot too soon learn that, while a very small amount of suitable material, properly arranged, will procure them what they want, a very large and burdensome quantity of it, as usually made up, will entirely fail to do anything of the kind. Here, then, I quite agree with Dr. Jaeger ; widely as I differ from him on other points, I consider that he deserves all credit for having so persistently called attention to the faults of our present style of dress on these heads, and shown that warmth can be procured without subjecting the human frame to such an unnecessary load."

Again : " If we had known nothing of this monstrous kind of clothing in our own day, and had only read the story in the pages of Molière or Voltaire ; if either of these brilliant satirists had drawn the picture of a patient consulting a physician for a defluxion of the lungs, and being ordered flannel or woollen to be doubled and trebled on each renewal of the at-

tack, the whole thing would be considered, not a scene drawn from the real life of their day, but a concoction in which inventive genius played a much greater part than reality."

Very true! Nevertheless, this picture of a "frame" doubly and trebly weighted down, overloaded and oppressed, is one drawn by Surgeon Milton's own pen, and that, too, without the ghost of a subject for a model. And, being drawn, it is curious to see how shrewdly he shies away from it. This is what follows:

" Yet, overdrawn as it might seem in a picture of bygone times, it only represents what scores of worthy people are doing day by day in our own age, when every cold is made the excuse for [what? Doubling and trebling the flannel load 'on each renewal of the attack' of 'defluxion of the lungs?' Oh, no, but] for clinging more devotedly to the flannel shirt, the very garment that has proved powerless to ward the cold off." Surgeon Milton's double and treble overloading, fourteen-pound greatcoat and all, dwindle down very suddenly to a single flannel shirt. He reverses the Falstaffian method of dealing with his men in buckram.

There are some things that Mr. Milton is willing to take the liberty of maintaining "till he is 'confuted';" and he thinks "It may safely be taken for granted that any one who has honestly tried linen, especially any one with a very sensitive skin or an irritative affection of this structure, will keep to it for the rest of their days."

In contrast with Surgeon MILTON'S arraignment of woollen fabrics the following is submitted from a recent publication entitled *Prevention of Disease in Tropical Campaigns*, by ANDREW DUNCAN, M.D., B.S. Lond., F.R.C.S., Surgeon, Bengal Army.

Dr. Duncan prefacing his comments upon the properties of clothing material for soldiers, with the never-to-be-neglected declaration that "the truest economy consists in the issue of the very best kind of clothing recommended."

"The properties of clothing that especially concern us in hot climates are those connected with absorption and conduction of heat; permeability of air; absorption of contagions and odors, and durability. In these points we find material and color exert very wide differences. With regard to absorp-

tion, this factor has to be considered with respect to heat, infectious principles, and moisture.

"Cotton is durable, non-absorbent of moisture, not very permeable to air, very absorbent of odors, and therefore probably of infective ferments. Having these properties, it certainly is not the material for the campaigning dress in hot climates. Taking cotton, linen, and khaki together, for their respective properties in all respects are such that they may be considered as one, we find (1) that the non-absorbing power of these materials as regards moisture is eminently unfavorable to the soldier on the war-path. The soldier is practically always working, consequently always more or less perspiring ; the perspiration passes through the non-absorbing material, and, evaporating, produces chill. (2) Again, permeability to air is an important factor as regards health in dress, but taking the permeability of flannel as 100, that of linen is only 58. (3) Our men are not always able to wash their clothes regularly. Now, Pettenkofer has shown that linen and cotton clothes which have been worn smell much stronger than woollen clothes. In fact, a woollen shirt which has been worn for a month does not smell nearly so bad as a linen one which has been worn for only a week. Now, inasmuch as the absorption of odors is supposed to resemble that of contagions,' we see that cotton in these respects is at a decided disadvantage to wool on a campaign.

"As regards absorption of heat, the powers of cotton and flannel may be considered equal. White cotton being taken as 100, white flannel will be represented as 102 in this respect. But as regards conduction of heat, cotton has much larger powers than wool.

"Now contrast wool with cotton in these respects : It has great absorbing powers of moisture. During exertion the evaporation of the perspiration from the body acts as one of the great cooling powers of the body ; now the vapor from the skin becomes condensed in the wool after exertion, and so returns to the body the large amount of heat rendered latent when the perspiration was becoming vaporized ; thus chills are kept off, and a pleasant feeling of warmth occurs to the body. Again, as a conductor of heat it is very slow ; here, again, after exertion, heat will not be rapidly conducted from the body, as in the case of cotton, and here, therefore, again chills will be avoided. The permeability to air—so necessary for the healthy exchange of gases and a healthy atmosphere immediately round the body—is nearly double that of cotton.

"Next, let us consider what are the indications to be carried out as regards the soldier's dress in hot-climate campaigns. They are the following :

" 1. To reduce the absorption and conduction of heat, and thus to avoid the condition producing sunstroke.

" 2. To maintain an equable temperature, and thus to avoid all those diseases of campaigns brought on by chill.

" 3. To obviate as far as possible the bad effects resulting from want of opportunity of washing.

" 4. To obviate all action adjuvent to infection.

" 5. To insure as much reduction of fatigue from mechanical work as possible, and so to lessen liability to heat-stroke.

" Such being the purposes to be fulfilled, we find that cotton and wool may be considered equal as regards their absorbing power of heat ; but in its far less power of conducting heat, in its far greater power of absorbing moisture and of maintaining an equable temperature round the body, in its better hygienic condition where clothes cannot be washed, and in its less power of absorbing contagious principles, flannel is immeasurably superior to cotton stuffs. And this has been the general experience of campaigns ; flannel has been found to be the best preservative against sickness. There is a general consensus of opinion that flannel and woollen stuff should be used and none other. One officer of experience has, however, come to the conclusion that all the above supposed advantages of flannel are erroneous. Dr. Veale says in his paper that it has never been found to protect men from tropical disease ; but, on the contrary, that it in all probability predisposes them to diseases of the circulation ; that it renders the skin over-sensitive to sudden changes ; that soldiers 'encased in it' are unable to endure long marches, and fall victims to sunstroke, ardent fever, and cardiac failure. All I can say in answer to Dr. Veale is, that this experience is contrary to general experience, for flannel *has* been found, by other authorities of equal experience, to protect from tropical disease ; secondly, that it does not render the skin more liable to sudden changes ; and, thirdly, that there is no reason why our men should be '*encased*' in it, and, moreover, I have never seen our men '*encased*' in any dress in the field. I advise strongly against any other material than flannel or wool ever being employed for the soldier's campaigning dress in hot climates. It may be taken, then, for granted that cotton and linen are *not* the materials for a campaigning dress.

" The highest perfection, however, in the material for a campaigning dress in hot climates would seem that introduced by Dr. Jaeger. This inventor has supplied the army with various kinds of his wool sanitary clothing, one kind being adapted for the tropics. It has already been introduced into the German Army. No linen is worn ; wool is everywhere in contact with the skin. The clothing has been so manufactured as to be perfectly unirritating to the skin ; the material pre-

serves an equable temperature round the body ; the shape and arrangement of the constituent hairs of the texture provide for the escape of moisture by capillary attraction ; and they equally act as the best conductors of the various fluid impurities, decomposing fatty acids, etc., from the skin. It seems to me that this sanitary wool clothing is exactly the clothing wanted for campaigning in hot climates, in which, as we have seen, alterations between the day and night temperatures so frequently come into play.

" To sum up, then. The campaigning soldier should wear next the skin textures of the nature of flannel. Jaeger's material is the best as yet invented. But whatever be the form of wool which is selected, the material should be the best of its kind. This will secure absence of all coarse, irritating material. We can well imagine a rough, coarse flannel shirt cannot be pleasant to wear ; the coarseness, especially, in part being due to a large admixture of cotton. Again, there can be no doubt that such material is the coolest to wear. Every one knows that it is far more agreeable to wear a merino vest under exertion than to be without one ; in the same way, it is far cooler to march in the heat with flannel next the skin. In the hottest days in India the coolest materials to wear are flannels. Sir Ronald Martin's experiment shows this fact forcibly. Place two beds in the same room during the day when the temperature is 90° F. ; let one be covered with a pair of blankets and the other with a pair of linen sheets. Remove both coverings in the evening : the bed on which the blankets were placed will be cool ; the other warm. Substitute a man for a bed, and we see how important a factor material will be as regards prevention of sunstroke."

On page 41 Dr. Duncan especially emphasizes the fact that " Linen and cotton are never to be worn next the skin, but always wool in one of its forms."

He adds (on the same page) : " Mr. Stanley's advice, in his recent work on the Congo, might well be borne in mind by the clothing committees of the army. ' The body must be divested of that armor in which it was accustomed to be encased in high latitudes, and must assume garments of soft, loose, light flannels. The decorous externals of Europe must yield to the more graceful and airy flannel of the tropics.' "

Finally the doctor says : " When I use the word ' flannel ' or ' woollen,' I would be always understood to urge that best form of all, Jaeger's sanitary clothing."

It is certainly to be regretted that, in speaking on a question involving so much that it is of vital interest to every living man, woman, and child, as that of hygienic clothing, Surgeon Milton will take the liberty of maintaining anything on a venture; that he has to take so much for granted, when, if his cause were a good one, it would be so easy to fortify himself with facts, of which he seems to have none outside of his hospital experience.

It is also, perhaps, to be regretted that, while the editor of the *Irish Textile Journal* and the hospital surgeon have an eye single to the interest of the Belfast manufacturer, they did not come to a better understanding respecting the status of their favorite fabric before espousing its championship in a crusade against wool and the Jaeger System. The editor says that "linen has already a good name throughout the length and breadth of the land, a firm position in the esteem of every true housewife, and a history to which no bounds can be put, abounding in picturesque incidents and familiar illustrations;" but the surgeon tells us that, "thanks to the persistency with which inferior substances have been thrust into notice, it is quite exceptional to find a person who knows what linen really is, and where to get it. When linen is recommended, patients [always patients] constantly assume that long-cloth is meant; when they ask for linen, and are served with stuff which goes by that name, though it may not contain a particle of good flax, they haven't the least idea that an imposition has been practised upon them; they expect fine linen for less than it costs the manufacturer to make it. Consequently, I believe that linen will not get fair play unless the Belfast people make its merits more known." And much more in the same strain. Thus, these two writers not only contradict each other, but the editor contradicts himself on this very point.

As an offset to Surgeon Milton's assumptions and guess-work we put in evidence the testimony of a witness who *knows* whereof he affirms after an experience exceeding Surgeon Milton's by some thirty-five years. The following extract is from a letter dated March 22d, 1891, to the Dr. Jaeger's Sanitary Woollen System Company, of New York, by Mr. LEWIS R. CLARK, of the firm of M. H. Clark & Bro., of Clarksville, Tenn.:

"For more than three years I have not worn any shirts, undershirts, drawers, socks, stockings, night-gowns, etc., except what I got from you. The underclothes and socks I have in four different weights. I have a dozen white cashmere shirts and a dozen striped taffeta. And I want to tell you that the clothes that I have gotten from you are the most delightful that I ever wore, and I have worn a great many, being between fifty and a hundred years old.

"And I want also to tell you that the four winters that I have worn your clothes are the only ones for many years that I have passed through without taking cold and without any sickness of any kind whatever. For nearly half a century that I can recollect, I had a bilious or malarious attack, or chills, or something or other every summer or fall, until I commenced wearing your clothes, and since then I have not had a day's sickness."

In view of the fact that it is as necessary to health and happiness to be rightly clothed as it is to be properly "fed," and in the light of Rumford's and Pettenkofer's teachings on the subject, to say nothing of Dr. Jaeger's work, (teachings respecting which it would be a harsh reflection upon Surgeon Milton's intelligence to suppose him to be ignorant,) it is hardly less than criminal in him to advocate the substitution of linen for woollen underwear. He would not be more obnoxious to public censure were he, in the interest of the rum trade, or of the tobacco-dealer, to recommend the general substitution of rum and tobacco for bread and meat as hygienic articles of diet.

As an example of the exigencies of the argument in favor of linen, we give here a passage from a previous number of the *Irish Textile Journal*, January 15th, 1891.

"So again," says the editor, "if we must have comparison between other fabrics and good linen, there is an old Roman author, Apuleius, which will stand as a commentary on the verses of Ezekiel :

"Can any one impressed with a sense of religion wonder that a man who has been made acquainted with so many mysteries of the gods should keep at home certain sacred emblems and wrap them in a linen cloth, the purest covering for divine objects? For wool, the excretion of a sluggish body, taken from sheep, was deemed a profane attire even according to the early tenets of Orpheus and Pythagoras. But flax, that

cleanest and best production of the field, is used, not only for the inner and outer clothing of the most holy priests of the Egyptians, but also for covering sacred objects."

When we consider the structure of the woollen fibre, its chemical composition, its wonderful physical properties, its repulsion to water, its affinity for vapor, its attraction for air, which outranks all substances as a non-conductor of heat and electricity, and the relation of all these facts and principles to the animal economy, it is no wonder that Count Rumford spoke of wool, and hair, and fur as being providentially designed for the clothing of an animal body. "Every fibre there is a declaration of infinite wisdom."—(J. E. TALMAGE, in *The Contributor*.)

To speak of them as "the *excretion* of a sluggish body," to any intelligent believer in an all-wise Creator, would be downright blasphemy. And we do not envy the moral estate of the man who can quote such an expression without a word of reprobating comment.

FIREPROOFING EXTERIOR SURFACES.—It is found that a most effective composition for fireproofing exterior surfaces may be formed by slackening a sufficient quantity of freshly-burned quicklime and adding such an amount of skim-milk, or water in its absence, as will make a liquid of the consistency of cream. To every ten gallons of this liquid are added, separately and in powder, and with constant stirring, the following ingredients in the order named : Two pounds of alum, twenty-four ounces subcarbonate of potassium, or commercial potash, and one pound of common salt. If white paint is desired, no further addition is made to the liquid, though the whiteness is found to be improved by a few ounces of plaster of Paris. Lampblack has the effect of giving a number of shades from slate color to black. But whatever tint is used it is incorporated at this stage ; and the whole, after being strained through a sieve, is run through a paint mill. When ready to apply, the paint is heated nearly to the boiling point of water, and is put on in its hot condition.—*American Gaslight Journal*.

TRANSACTIONS OF THE SEVENTH ANNUAL
MEETING OF THE AMERICAN CLIMATOLOGI-
CAL ASSOCIATION, HELD AT DENVER, COL.,
SEPTEMBER, 1890. (Continued from page 349.)

THE EFFECTS OF DRY ATMOSPHERE ON CHRONIC
INFLAMMATION OF THE LARYNX AND NARES.

By E. FLETCHER INGALS, A.M., M.D., of Chicago, Ill.

IN this paper it is my object to invite your attention to a subject upon which, unfortunately, we have little precise information, hoping thereby to elicit a discussion in which the observation of others may help to remove the deficiencies which I am obliged to confess. The views which I shall here express are based on the study of a large number of cases, but I shall make no attempt to present the histories of these cases in substantiation. Most of my patients live in low altitudes, many of which are damp ; though I frequently see patients who live in a high and dry atmosphere.

In trying to analyze these cases I have been unable to decide satisfactorily what particular phases of the disease are benefited and what injured by the dry atmosphere. In the majority, I presume at least four-fifths, dryness of the atmosphere seems beneficial, but in some it is certainly injurious. At first sight it would seem that cases in which there is excessive secretion would be benefited by residence in a dry atmosphere, whereas those suffering from the opposite condition would be injured, but numerous cases attest that this does not follow in all instances : for example, in simple chronic rhinitis, with excessive discharge, we find a given number of patients improved by removal from the shores of large bodies of water inland, but a limited number of cases with the same disease will be benefited by moving from inland districts to the damp climate of the sea-shore, or the borders of our Great Lakes. We find now and then a patient greatly improved by going to a high altitude with a dry atmosphere, but usually catarrhal cases are injured by this change.

The more we see of these diseases, the more we are impressed with the fact that catarrhal inflammations are found

alike in the damp, chilly atmosphere of the sea-shore, or upon the arid plains of Arizona, in the most favored localities of our Southern States, and in the delightful atmosphere of Colorado, though not to the same degree in each section.

We may assume that the inflammatory affections of the nares and larynx are essentially of the same character, and that therefore they will be influenced in a like manner, though in different degrees, by various climatic conditions.

These affections we will therefore class together as catarrhal, excepting in those instances where we use a qualifying phrase, as for example, tubercular laryngitis.

Usually these catarrhal affections are less frequent in warm climates, therefore, a warm, equable atmosphere would seem best adapted for their prevention or cure. However, in equable climates the air is loaded with moisture, a condition which undoubtedly favors the development and maintenance of certain forms of catarrhal inflammation, yet the opposite condition of dryness also has its disadvantages, for it favors the formation of dust, and allows the air to be laden with various irritating substances which might be absent in the damper atmosphere. As certain impalpable substances in the atmosphere cause asthma, so in some cases similar substances will excite chronic inflammation of the mucous membrane of the upper air-passages. The damp, and often chilly atmosphere of the Atlantic sea-shore, and the sudden changes along the borders of our Great Lakes are peculiarly favorable to the development of this disease. Nevertheless, a considerable number of the cases that come to those of us who practise in these localities have originated inland. We frequently find that a person having developed the disease in any given locality will be relieved of it by a change to some other locality, though the latter may be either dryer or more moist than the original residence. I know many that are afflicted with the disease upon the shores of Lake Michigan, who, upon going but a few miles into the country are at once relieved. I have known those who could not live with comfort on the sea-shore to have but little difficulty upon the shores of our lakes. I have seen those who have attributed their whole trouble to the sudden and severe atmospheric changes on the borders of our Great Lakes to become much worse by residence in an

equable climate. For example, a patient suffering from a moderate degree of hypertrophic rhinitis went from Chicago to Southern California in hopes of obtaining relief, but there he was unable to breathe through the nose at all, and he was compelled to return to Chicago.

With these conflicting facts before us, how can we determine what climate to recommend to our catarrhal patients? We have observed that as a rule they do best in a comparatively dry climate not more than one or two thousand feet above the level of the sea, but there are many exceptions to this. Occasional cases are greatly benefited by a sojourn in high altitudes, and I hope to hear from the physicians of this locality what particular phases of the disease improve in Colorado.

By ascertaining individual patients the season of the year, and the kind of days when they feel most comfortable, we may often be able to judge of the most suitable climate for them. Yet it frequently happens with these cases, as with asthmatics, that the climate must be tried by each patient for himself in order to determine what atmospheric condition is best suited to his diseases.

Before sending such cases from home we should try faithfully the methods of treatment which have been found most beneficial by expert laryngologists. If these do not succeed we should recommend a dry or moist climate, according to the kind of weather in which the patient feels best—at an altitude of not more than one or two thousand feet above the sea, or even less than this. High altitudes should be tried only incidentally, as they are not apt to prove beneficial.

My observation, which embraces several thousand patients, leads me to the following conclusions :

A dry atmosphere at a comparatively low altitude will generally be found beneficial in the following diseases :

In rhinitis intumescens, which is characterized by intermittent swelling of the tubernated tissues, with obstruction of one or both nares, and the consequent discharges into the throat.

In simple chronic rhinitis, with or without excessive secretions ; providing there is but little irritation of the mucous membrane.

In atropic rhinitis with excessive muco-purulent discharge, with but little tendency to drying.

In such cases of hyperæsthetic rhinitis as improved during the dryer portions of the year. However, most cases of hyperæsthetic rhinitis will be more benefited by an equable climate even though the atmosphere be loaded with moisture.

A high and dry atmosphere is usually prejudicial in rhinitis intumescens and in atrophic and hypertrophic rhinitis, and indeed in all catarrhal affections occurring in patients of nervous temperament. These injurious effects may be ascribed partly to the dryness of the atmosphere, partly to the irritating dust often found in high altitudes, and partly to the effects of the rare atmosphere upon the nervous system which undoubtedly has much to do with the etiology of catarrh.

A high and dry atmosphere may be expected to prove beneficial in cases where there is excessive secretion with little or no nervous irritability ; in some cases due to syphilis, and in exceptional cases of atrophic rhinitis with excessive secretion.

In inflammatory affections of the *larynx* we may expect benefit at a low altitude with a dry atmosphere ; in simple chronic laryngitis, and in some cases of tubercular laryngitis. In the latter, however, I prefer an altitude of from 1500 to 2500 feet, and there is no objection to the atmosphere being impregnated with the odors of pine and fir which the laity consider of so much importance ; but I doubt whether these are of any benefit.

In cases of laryngitis with deficient secretion, or excessive irritability of the mucous membrane, the moist atmosphere of equable climates is generally preferable.

A high and dry atmosphere is usually injurious to persons suffering from chronic laryngitis, but it is beneficial in exceptional cases. My observation, however, does not enable me to decide what cases will be improved by this condition. But it seems probable that benefit would be derived in certain cases of simple laryngitis in phlegmatic patients ; in some cases due to syphilis in which the mucous membrane requires stimulation, and in exceptional cases of tubercular laryngitis, in which the beneficial effects of the atmosphere upon the constitutional disease more than counterbalance its deleterious influence upon the local affection. The latter are most likely

to be found in patients in whom the mucous membrane of the larynx is not very sensitive. In laryngo-pulmonary tuberculosis patients usually do best at an altitude of from 1500 to 2500 feet, in a warm and dry atmosphere, but it is often difficult to determine what is best for them because of the beneficial effects of high altitudes on tuberculosis of the lungs and their baneful effects on the same disease affecting the larynx.

The injurious effects of such an atmosphere on the larynx are often attributed to the dust which it contains, but the explanation is unsatisfactory, for in persons who are continually inhaling much more dust, in planing-mills or machine-shops, the injurious effects are oftener manifested on the lungs than the larynx.

It seems probable that the action of this atmosphere on the mucous membrane of the upper air-passages is not very dissimilar to that of the wind and sun upon the skin unused to exposure.

Owing to its dryness it causes rapid desiccation and destruction of the superficial epithelial cells, with consequent irritation of the subjacent tissues, which in addition to the increased flow of blood to the part, resulting from diminished air pressure, necessarily increase the inflammatory action.

DISCUSSION.

Dr. Atkins: Mr. President, in the absence of my colleagues from New Mexico, I felt rather mortified a few minutes ago in not following the gentleman across the aisle (Dr. Schenck) when he praised our climate. My stronger brethren might have come forward. Yesterday I spoke in favor of our climate, but now I speak on the adverse side. Yesterday I remarked upon the frequency of pharyngitis and superficial tonsillitis, and suggested they probably had a climatic origin, in many instances due to the changes and dry air of the different seasons.

In regard to nasal catarrh and super-pharyngeal catarrh, I find we usually have those cases in New Mexico when we have high winds and an unusual amount of dust. Some of these gentlemen will remember when Lord MacKenzie, some years

ago, travelled over this country, and the citizens asked him to lecture to them, he denominated this disease "the great American disease, the great nasal catarrh," and he said he became satisfied that over the whole continent it was due to dust; he regarding New York as dry and dusty even as compared with London. But I am satisfied that such cases do not do well in New Mexico. I am not sure that many cases originate there, of chronic nasal catarrh, but cases that already exist do not do well; and frequently, in answering letters inquiring whether catarrhal cases should be sent to New Mexico, I have almost universally answered that I would prefer they should not come.

I noticed in our town also a large percentage of mouth-breathers among the children or the quite young persons, and I am entirely at a loss to account for it—whether it strictly originated there; but many of them were born there, and some of them came when they were quite young, and of apparently quite healthy families, and yet it is quite a striking feature to see them in public places with their mouths hanging open; when I have taken their temperature with the thermometer I could not make them close their mouths and breathe through their noses, and I had to transfer the thermometer to the axilla.

I have noticed, in regard to tubercular laryngitis, the few cases I have observed in New Mexico are bad, and I have made the remark that it is hardly desirable for such cases to come there. I don't know as the same prevails in the southern region.

I should recommend to Dr. Ingals and his fellows in the East not to send those cases of rhinitis or super-pharyngeal catarrh to our dry and dusty region.

Dr. Knight: I think it ought to be borne in mind in this stage of our knowledge that these cases of "catarrh" cover a good many different conditions, as Dr. Ingals knows; and in writing his paper he had reference undoubtedly to the catarrhal conditions which were irremediable by operative treatment; but the profession generally have not come to that knowledge. Some cases of so-called catarrh are dependent upon organic lesions, which have the same effect in keeping up the discharge that a stricture of the urethra does in keep-

ing up the chronic discharge there. So that it is not quite fair, perhaps, to consider the effects of climate, except incidentally, upon the symptoms of the patient, until we are quite sure that he has not got some obstructive conditions which can be remedied.

Now, in regard to mouth-breathers, that condition nine times out of ten, I should say, in young children, is due to an hypertrophied adenoid tissue of the vault of the pharynx, the removal of which is usually followed by a complete cure. Once in a while you see a child breathing through the mouth, and having that stupid appearance from enlarged oral tonsils, but it is very rare ; it was formerly attributed to the enlargement of the oral tonsils before we knew much about the pharyngeal tonsil ; nowadays, if we find the pharyngeal tonsil enlarged, its removal will be followed by a cure of mouth-breathing, even if the oral tonsils remain somewhat enlarged.

As far as I have been able to observe the effect of temperature and moisture upon the condition of the mucous membrane, it seems to me that the one obnoxious combination is coldness and moisture ; that the warm, moist climate may be very tolerable, but a cold, moist one is most intolerable. At any rate, it is so in New England, and keeps up the most irritation of the mucous membranes generally.

Dr. Solly : Dr. Ingals has touched on a subject which has interested me very much, but I can't say that I have arrived at any definite conclusions ; but the impressions I have arrived at are about these, leaving out cases of operative interference, which are not in discussion, I suppose. It seems to me that a broad distinction lies between the mucous membrane which is anæmic and that which is hyperæmic, that would tend to hyperæmia locally which is aggravated by a climate such as Colorado. You get an anæmic person, coming with a profuse discharge from the nose and from the pharynx, or a case of catarrhal condition of the larynx, accompanied with more or less tumidity of the tissues, you will find those cases improve generally very markedly.

We find in chronic laryngitis, which accompanies consumption so frequently—I mean that which is not obviously tubercular—they nearly always improve ; the condition of the voice improves, and the throat improves ; and if they have nasal

catarrh, that improves generally, and it is very apt to remain improved even when the general health is failing. My recollection is, even where the cases are going down-hill in other respects, if they once rallied up to a certain extent, they won't begin to lose their voices again, and be in the trouble they were before, as a rule.

But those that have the hyperæmic appearance or tendency to irritability of the mucous membrane find it worse. We find it so in the bronchial membrane; those cases attended with a considerable cough are not generally suited for treatment here.

Tubercular laryngitis, of course, is a disease that does well literally nowhere; but they have been superseded by the number of cases where there has been improvement, not where there may have been death from that or from other causes, but where ulcers have failed to heal in the East, they have been treated in the best possible way, and have come out here and yielded to treatment in a remarkable way. But where there is a deposit of tubercles remaining, the ulcerations will break out again, and the patient may die, and usually does die; but there is the direct local effect of the air so far as we could judge, with the accompanying improvement in health, which would seem to tend to heal them; and I think the broad line to be drawn is between that type of catarrhal disease which tends to be anæmic and that which tends to be hyperæmic.

Dr. Ingals: I am glad for the suggestion made by Dr. Solly. It has occurred to me frequently; but, as I say, I have not seen enough cases that have been in high altitudes so I could feel at all certain about it. The paper was designed to refer simply to the effects of climate on these diseases, and not to the methods which are adopted by laryngologists in their treatment of them.

I want, however, specially to emphasize what Dr. Knight said about mouth-breathing, and its cause being, in young children, so very very often a growth in the nasal pharynx. I don't know any one thing that gives me more satisfaction than to cure these little fellows; and it is done so very speedily, and it makes such a perfect revelation in their general condition, I think physicians ought more generally to recognize it.

THE MODIFICATION OF TUBERCULOSIS BY CLIMATE.—REPORT OF CASES.

By H. A. JOHNSON, M.D., Chicago, Ill.

THAT there are many factors influencing the progress and termination of tuberculosis seems to be evident. It is quite certain that many patients improve or recover after making a change of climate who would in all probability have gone steadily downward if they had remained in the locality where the disease first developed.

The reasons for this improvement are probably multiple. It does not seem to depend upon any one element of climate. The mechanical effects of barometric pressure do not furnish a satisfactory explanation. It is not the result of any special range of temperature. It is not moisture or the absence of moisture alone.

We have probably been searching among comparatively unimportant agencies for the solution of the problem. In other words our theories have been mechanical. We shall probably find that climates modify tuberculosis not directly but indirectly—that is, through their influence upon microscopic life in general ; that the reciprocal influences of living organisms, and consequently the conditions favoring or retarding the growth and propagation of microbes furnish in any locality the most satisfactory explanation for the prevalence or absence of tuberculosis.

The experiments of Professor Charles Bouchard, detailed in a memoir published during the present year, the substance of which has been communicated to the tenth International Medical Congress, go far to demonstrate the proposition that in the case of tuberculosis and other infectious diseases, the products—that is, the secretions of the bacillus absorbed into the system, while not producing the disease itself, do produce in some way a diminished resistance to the disease. These experiments also furnish a plausible explanation of the way in which the microbian products act. It was found that the walls of

blood-vessels were constricted by the presence in the blood of these substances, or by their contact with the vessels locally ; the result was, however, much more marked when the products were introduced into the circulating blood. By careful and ingenious methods of observation it was demonstrated that this contraction of the vessels prevented the diapedesis of leucocytes, the destroyers of invading germs. The secretions of a simple saprophyte, and of other non-pathogenic forms, may so affect the walls of the vessels as to hold in check the migratory cells until the tubercular or other virulent forms have gained a substantial hold upon the tissues, and by their own secretions are able to maintain this poisonous influence upon the vascular structures. It is probably in this way that infection intensifies infection, and that among decaying structures the resistance of living organisms to invasion is lessened, and that even though the bacteria of the decaying structures are not themselves pathogenic, their secretions absorbed into the system contract the vessels, and in this way arrest the normal activities and agencies for defence.

As a rule, we shall probably find that where microscopic life in its various forms flourishes, there tuberculosis finds its most yielding victims ; where microbic forms are at a minimum there tuberculosis is also at a minimum. On a clean ship on the wide sea, in the midst of a desert, below sea-level, on high, arid plains, on mountain heights, or beneath Arctic skies, wherever, in fact, the conditions favorable for bacterial growth are comparatively wanting, there consumption is not frequent. It is certain that the forms or spores of the bacillus tuberculosis are carried to all these regions. They have their habitat in living organisms. This habitat is present and is subject to attack as in the localities where consumption abounds, but in the absence of the products of other bacteria diapedesis takes place, the leucocytes meet the invaders, and the disease-producing germs are destroyed. It is true, phagocytosis has been much discussed, and by many questioned, but these experiments of Bouchard seem to leave no room for doubt as to the fact.

This demonstration of the relation of microbic forms, other than those specifically connected with the disease, to the development and progress of tuberculosis seems to bring into

logical relation the facts noted by so many competent observers in widely different localities. These localities present great contrasts in temperature, in barometric pressure, in the amount of moisture dissolved in the air, etc., but they all agree in this fact, that bacterial life is at a minimum ; in all these localities the putrefactive processes, the destruction of organized tissues is slow, and for the reason that the microbes, the agents of this destruction, do not flourish.

By the use of disinfectants we are trying to accomplish in our crowded centres of population the death of the microbes and the sterilization of the soil in which they grow.

With all our efforts, however, we cannot reach that measure of success already attained by nature in the terebinthinate forests, on the dry plains, on mountains, or on the ocean away from the contaminating influences of decaying animal and vegetable substances.

I beg to present to the Association brief abstracts of twenty-five cases taken from my record books in the order of their entry. They embrace every case which, during about three years, from 1872 to 1875, went to the Western States or Territories, and of which I was able to obtain any subsequent history. It is, as every one knows who has made an effort to do so, very difficult to follow up patients who are migratory in their habits. The numbers might be largely increased if cases of more recent date should be thought desirable. In this series there is not one later than 1875. I have included only cases going to the arid regions, not because they were the only ones who improved or recovered. Patients who went to the South or Southeast, many of them did well. This series does not, therefore, furnish any basis of comparison between the arid and other regions.

Of these twenty-five cases ten recovered. Their histories cover from three to fifteen years, averaging eight years. Eight improved ; six of them very much improved and only two slightly. Seven did not improve ; it is not certain that any were injured.

Some of the cases which improved returned East after a few months, when the disease again became active. In such cases a return to the arid regions did not seem to have the same influence in modifying its course as at the first visit.

It will be observed that a large majority of the patients were males. I presume this fact is to be accounted for by the greater ease with which men travel and accommodate themselves to the rough ways of living in a new country. It is quite possible that the proportion of men to women now, if taken from my own books, would be different.

Number of Case.	Time in West or under Observation.	Unimproved.
4	A few months. ¹	Worse.
7	A few months.	No better.
12	4 months.	No better.
15	3 months.	No better.
17	3 months.	No better.
18	9 months.	No better.
21	One year.	No better.

No. of cases unimproved.....7

Number of Case.	Time in West or under Observation.	Improved.
5	Several months.	Much.
8	One year.	Much.
10	Six months.	Slightly.
14	2½ years.	Much.
16	9 months.	Slightly.
21	2 years.	Much.
22	2 years.	Much.
24	8 months.	Much.

No. of cases improved.....8

Number of Case.	Time in West or under Observation.	Cured.
1	14 years.	Cured.
2	4 years.	Cured.
3	2 years.	Cured.
6	4 years.	Cured.
9	13 years.	Cured.
11	8 years.	Cured.
13	10 years.	Cured.
19	2 years.	Cured.
23	3 years.	Cured.
25	15 years.	Cured.

No. of cases cured.....10

Case No. 1. Male, age 22, clerk; no hereditary history. Deposits in right top; had hemorrhage; went to Colorado and remained there. I saw him fourteen years afterward. In fair health.

Case No. 2. Male, age 43, lawyer; no family history. Had hemorrhage two years before consultation. Deposits in left top. Went to California. Eleven years later saw him. He had quite recovered.

Case No. 3. Male, age 28, office work; no family history; no hemorrhage. Deposits in left top. Went to South Colorado and New Mexico; remained there. Two years later was quite well.

Case No. 4. Male, age 24. Had been hoarse five years after typhoid-fever; not well since. Deposits in left top. No hemorrhage. Went to Colorado; stayed only a few months; worse after coming home. Laryngeal phthisis; doubtful about going to light altitudes. Did not advise it. He went back to Denver. Ten years afterward he came to this region and in a short time began to cough again. He then returned to Denver. Four years later he was in fair health. Within the last few months I have heard from him. Said to be "all right."

Case No. 5. Male, 44, lawyer. No family history. Colds and cough for three years. Deposits in both lungs; cavities in right; no hemorrhages. Went to Colorado and remained several months. Came back very much improved.

Case No. 6. Male, age 32, physician. No family history. One hemorrhage. Deposits in superior right. No cavity. Went to San Diego; lung troubles improved, and after four years was pronounced cured. Subsequently died of intestinal nephritis.

Case No. 7. Male, age 22, merchant. Mother died of consumption; hemorrhage one year before consultation. Deposits in right lung, with moist râles. Pharynx and larynx involved. Went to Colorado. Received no benefit.

Case No. 8. Male, age 36, banker. No family history. Hemorrhage; cough; deposits in right top. Went to Denver, and in one month wrote that he was well. Advised him to stay West, but he came home next year; disease developed, and went to Santa Barbara; gained for a year or more; began to run down, and died five years after first consultation.

Case No. 9. Male, age 22, office work. No history of phthisis. Hemorrhage first symptom that alarmed him. Deposits in right lung. Went to Denver and remained several months; was so much better that he came home; continued fairly well for three years, but spent winters in Southern California. Six years after first consultation he was in good or fair health. Physical signs normal (at time of first examination dulness on right clavicular, infraclavicular, and mammae. Expiration prolonged over the same). Thirteen years after first consultation saw him and examined him again. No change in physical signs during last seven years. In good weight and health, except a slight acute pharyngitis, for which he came to the office.

Case No. 10. Female, age 18. No family history. Cough for several months. No hemorrhage. Deposits in superior half of right lung; no cavity. A few days after examination spat blood. Went to Denver and spent winter. Dr. — says she is improving. Died about six months later; particulars unknown.

Case No. 11. Male, age 34, lawyer. Father's family asthmatic and consumptive; father asthmatic. No hemorrhage; cough. Deposits in right lung, superior portion. No cavities. Went to Denver. I saw him there eight years later, and he said he was perfectly well.

Case No. 12. Male, age 35, machinist. Some trouble in right side eighteen months; now cavity in right lung. Is on way to California. Died in Los Angeles four months later.

Case No. 13. Female, age 26, housewife. Father died of phthisis. No other members of family or near relatives consumptives. Coughing and shortness of breath. Deposits in right top, and broncho-vesicular breath sounds left top. Went to Western Kansas. Saw her ten years later. Physical signs in right chest about as when first saw her.

Case No. 14. Female, age 27, domestic. Mother died of consumption. Coughing three months or more; cavity in infraclavicular region of right lung. Asked whether she should go home to Ireland, stay here in Chicago, or go to Colorado. Wants to go West. I consented reluctantly, as the progress had been rapid. She went to Colorado, and two and one half years ($2\frac{1}{2}$) afterward learned that she had been in Colorado all

the time after the examination, and was in fair health ; able to do her work as a domestic. Not heard from since.

Case No. 15. Male, age 29, railroad superintendent. No family history of phthisis. Lost thirty pounds in last six months. Dulness at top of left, and slight at top of right, lung. Broncho-vesicular breathing. Epiglottis rough. Pulse frequent (120) ; breathing hurried. Advised Colorado. Went and stayed eight weeks ; cough was dry and troublesome (this was early summer). Physical signs in left chest more marked ; laryngeal symptoms more troublesome ; physical signs. Changed for the worse. In a letter from Colorado Springs, dated July, he says : "In my opinion this country is a humbug of the first water"—a hasty conclusion, certainly, and with such an opinion he could hardly do well in the best of climates.

Case No. 16. Male, age 29, merchant. No family history. Deposits in right top ; no cavity. Advised Denver ; went and stayed three months ; came back better ; gained constantly while there, but immediately began to run down ; voice hoarse, and physical signs soon began to be more marked. Urged him to go back. He went to California—San Francisco, Santa Barbara, and Los Angeles. At first he improved a little, but soon began to fail. In a letter written about six months after going to the Coast, he says : "My intention is to leave here soon and go to Colorado, where I was last summer and improved more than here." He came to Chicago two months later. Examination revealed a marked extension of the lesions ; had lost eight or nine pounds—all that he gained in Colorado. He died in Chicago two months later.

Case No. 17. Male, age 33, clerk. No family history of phthisis. Cough last six months. No hemorrhage. Deposits in tops of both lungs. No cavities. Remained in Chicago six months and then, having grown worse, went to Denver and died there about three months later.

Case No. 18. Male, age 24, attorney. Family consumptive. No hemorrhage. Physical signs indicate deposits in right apex. Three months later went to Denver and remained nine months. He thinks he has held his own, but has not notably gained. I find he has lost five pounds in weight, and that there is a decided extension of the trouble in the right lung. He died in Chicago eight months later.

Case No. 19. Male, age 29, merchant. No family history of lung troubles. No hemorrhage; some cough and hoarseness for last eight months. Deposits in left lung, tubular and gurgling sounds at top; feeble breath sounds at base. He went to Colorado, though the physical signs indicated cavities in the left lung. The right lung was healthy, at least I could discover no evidence of deposits. Two years later he reported that he was fairly well—"in good condition," to use the language of the reporter. Have not heard from him since.

Case No. 20. Male, age 21, telegraph operator. No family history. For some months cough; hemorrhage three years ago. Dulness over left top, above and below clavicle; tubular breath sounds over left apex; broncho-vesicular breath sounds also at right top. Went to Colorado. Two years later he wrote that he had maintained his weight, and able to do business, but still coughed; not heard from since.

Case No. 21. Male, age 21. Just out of college—Yale. Coughing three months. Family history of consumption on mother's side. Hemorrhage. Went to California—Santa Clara Valley—and afterward to Denver. No cavity when he left here. One year later Dr. Bancroft writes that "there is a cavity in apex of right lung." Came back to Chicago, and died four months later.

Case No. 22. Male, age 43, merchant. Family consumptive. Cough for several months. Deposits in right top. Went to Southern California and spent the winter. Came back much better. Spent the next winter in Florida and South Carolina—Aiken. Thought California better than the South. Two years later was in fair health and the physical signs unchanged for the worse. Spent the next two winters in the West on the plains, and held his own; not heard from since.

Case No. 23. Female, age 22. Family history of consumption. Hemorrhage the first symptom to attract attention. Soon afterward found evidence of deposits in the tops of both lungs. She went to Denver and, three years later, wrote that she is fairly well. Has gained in weight and appetite. She says "the climate agrees with me very well."

Case No. 24. Male, age 34, lawyer. Cough several months. Hemorrhage. Evidence of deposits in right top. Advised

him to go to Colorado. Went to New York. Came back and had hemorrhage again. Six months later came for re-examination. Not much change in physical signs. Again advised Colorado. He went to Denver and Colorado Springs and remained there eight months, when he came back much improved; urged him to go back, but he declined. Went to New York, and Dr. A. Clark advised him to go to California on a sailing vessel around the Horn. A letter from him at San Francisco says he did well on the voyage, but not so well in California (San Francisco). Regrets that he did not remain in Colorado. Subsequently came back to Chicago, and died from profuse hemorrhage.

Case No. 25. Male, age 20, railroad clerk. Family consumptive. Cough for several weeks, and has been losing weight. Has night-sweats; dulness and sub-crepitant râles over left lung; no hemorrhage. Went to Colorado and improved. Came back after a few months and went to Massachusetts. Cough returned.

THE CLIMATE OF AJACCIO.

By A. TUCKER WISE, M.D., of Maloja, Switzerland.

THE best qualification for any physician recommending a patient to leave his home for a foreign health-resort is, that the adviser has himself lived in the health-station he recommends. By this ounce of experience, which is worth a pound of theory, or gleanings from other sources, a true estimate can be made of the drawbacks and advantages of climatic treatment.

From my own experience, in practice on the Continent, I find that the most discontented persons are those who have never had the disadvantages of foreign travel and foreign residence clearly set before them, but have relied mostly on the glowing advertisements of blue sky and sunshine everywhere, of which one reads, while the winter sunshine of the Riviera, for example, can be totalled up in hundreds of hours, with the object of outstripping some rival resort, any resident knows of from personal experience in these beautiful climates ; insomuch that no invalid can safely venture out of doors before 9.30 or 10 A.M., owing to the chilly morning air and the heavy dews which lie wet on the pavements, even on the pavements of the towns along the Mediterranean shore. And the most treacherous and dangerous part of the day is that preceding sundown, when the loss of heat by terrestrial radiation is so rapid that delicate persons should be indoors long before the sun dips below the horizon.

At the beginning of last winter, I was induced to visit Ajaccio, having had that winter station highly recommended to me, and from the literature on health resorts at my disposal I found glowing accounts of Corsica Island, of which Ajaccio is the principal town, having a population of 20,000, situated at the central border of a beautiful and well-protected bay opening to the southwest. It lies on a parallel with the southern part of Wyoming, but, as we shall presently see, has not the slightest resemblance to the climate of any inland place.

Fifteen to twenty miles in the rear of Ajaccio is a semi-circular mountain-chain of granitic formation sloping down to undulating foot-hills, and presenting a glowing panorama at sundown. During the winter season the distant peaks of Monte Cinto, Rotondo, and d'Oro are capped with snow, and the chilly northeast wind over the Gulf of Genoa is dried and broken in force before it reaches the western shore, where it is again arrested near Ajaccio by the sheltering hills surrounding the town. The visitors' quarter is away from the business part of the town, along the Cours Grandval, and begins a gentle slope at the Hotel Continental to the Place Casone, the military parade ground. Beyond this, stretching away toward Point Parata, are the fertile and picturesque slopes of Barbacaja and Vignola, dotted here and there with orange-groves, vineyards, olives, and the prickly pear. The only blot on this fair landscape is a cemetery of huge proportions scattered over with mausoleums. Nearly every family of any importance, or that wishes to be considered so, builds a "chapelle" wherein to bury their dead. These solid structures form a striking feature on entering the Bay of Ajaccio. They are not all limited to the cemetery and its neighborhood, but some are perched here and there among the olive-groves, occupying the choicest building sites in the vicinity.

It is impossible to mention Ajaccio without referring to the wonderful fortunes of the Bonaparte family. The father, a notary, occupied a good social position in the town. He spent his time chiefly in carrying on lawsuits against the Jesuits of Ajaccio, with the object of obtaining a disputed estate for his large family (five of whom died young), caused him some anxiety as to their future. Undreamed of destinies! Napoleon, the second-born, becomes the greatest general of all time, and the remaining seven children count four kings among them, one queen, and two princesses. The house in which Napoleon was born is preserved as a curiosity, and the memory of the Corsican's personality is never lost while one resides in Ajaccio, but is constantly freshened by relics and remembrances of the illustrious soldier's early days.

The soil at Ajaccio is disintegrated granite, and allows a rapid disappearance of the heavy showers which fall during autumn. But, unlike the Riviera, little rain falls in March.

Rows of orange trees are seen as boulevards in the town, covered in November with fruit, and during spring, when full of blossom, contrast strangely with the malodorous and dirty streets. The gardens are filled with luxuriant vegetation. Bananas, the delicate carouba tree, a few palms, oranges, lemons, a variety of cacti, and the castor-oil plant; the prickly pear, aloe, fig, and olive grow everywhere. Many eucalyptus trees have been planted, with a view to affording an antidote to the miasms which exist in the low-lying and damp localities during summer time. These trees grow rapidly, and furnish a useful wood for household purposes, as well as being graceful and ornamental. Along the Cours Grandval some flourishing plane trees form a boulevard, and remain green well into the month of December.

Inland, at elevations of 2000 feet, the olive gives place to the chestnut tree. The chestnut is looked upon by the indolent native as the most important production of the country, requiring little labor and attention, and affording a ready means of subsistence. The chestnuts are dried by heat, and when wanted are ground into flour to make a species of cake. Above 3000 feet are beeches and oaks, and higher still the juniper and pine.

The first range of hills surrounding Ajaccio is from 1500 to 2000 feet above the sea, and about three miles distant. The hills are all primary granitic formation, and are part of the jagged, irregular chain which traverses the island from north to south on its western half. On the eastern side a range runs from north to south of calcareous rocks; these have been washed down in past ages, forming sloping alluvial plains, which get overflowed by the sea. The burning summer sun and decaying vegetation give rise to the most deadly malaria, and render the lower levels near the sea quite uninhabitable during summer time. Although this is not the case near Ajaccio, malarial-fevers are frequent in hot weather, even in the town itself.

The water-supply is of a pure and fairly soft quality, brought to the town from Carazzi, twelve miles distant, by the Gravond Canal. Owing to the wholesomeness of this water, and, in part, to the peculiarity of the soil, Corsica has experienced a remarkable immunity from cholera epidemics. The binding

action of rain on the calcareous granite used as pavement for the roads, and the weight of this material, prevents the roads becoming dusty, even during dry weather. After rain, too, there is surprisingly little inconvenience from mud, for all the heavy dust consolidates into a sort of mortar and necessitates but little labor for road cleaning. The porosity of the subsoil accounts for the rapid disappearance of moisture after rain, when the sun may shine out clear, and the roads be quite dry in half an hour.

Stormy days in autumn are common, and, with cutting westerly winds and heavy showers, are very chilling in a temperature of 48° and 50° F. A slight tinge of north in these storms gives the mistral characteristics so well known on the Riviera, but the occurrence of the true Riviera mistral is very rare in Ajaccio. This exemption constitutes one of the important points in the climate, and makes the place compare favorably with the mainland stations, where the mistral is the dreaded wind, especially at Nice.

The term "libeccio" is given to a southwest moist wind, and the southeast wind goes by the name "sirocco." All these currents produce different and marked effects. The sirocco is warm, first dry and then wet. It resembles the föhn in the high Alps of Switzerland, but is, of course, much higher in temperature; the effects on the body, however, are almost identical, producing depression of spirits, loss of appetite, and sleeplessness, and causing feverish symptoms in pulmonary cases. The "libeccio," on the other hand, is a temperate and soft wind, with genial bright weather, and prevails as a high current throughout the greater part of winter, and in spring its continuance for a prolonged period is almost a certainty.

The mean temperature during winter is about 55° F., with a limited range, rarely exceeding 10° F. day temperature for a whole winter. On an average, the minimum thermometer falls to freezing point once in a winter, but with this degree of morning cold the day may be bright, warm, and pleasant.

The average number of rainy days is thirty for the season, and the relative humidity 82° .

From my own personal point of view, I regard Ajaccio as the most comfortable climate I have ever visited, with the exception of the winters in the Bermudas, and, in comparison

with Madeira, it is certainly more bracing and agreeable to the able-bodied.

The climate can be described as a soft, temperate climate, more sedative than any part along the Riviera, and although liable to variations in temperature, these are not so pronounced as at Nice and Cannes, or even Mentone and San Remo. Ajaccio ranks between Madeira and the Italian Riviera, but is warmer than the latter and more equable. Every visitor is struck by the marked absence of wind and dust. These pleasant conditions permit of walking exercise or "sitting out" with any one in delicate health, but as there is a sudden fall of temperature at 4 o'clock or 4.30, similar to that on the Riviera, although not so pronounced, it is advisable for all invalids to seek the shelter of the house about this time.

The cases most suitable and likely to be benefited by a winter's residence are lung affection, with high temperatures and nervous irritability, especially the erethistic form of phthisis, for which Alpine heights are so unsuitable.

The phthisis of advanced life, with cardiac feebleness, where the powers of resistance to cold are at a low ebb, or there is much emphysema, with cold, livid extremities—the class of invalids killed in Europe by mountain air.

Disease of the lungs, where the breathing powers are greatly diminished, or where a stubborn cough is a prominent symptom.

Gouty subjects appear to be more free from acute attacks of this disease than elsewhere, and eczema gives less trouble and inconvenience.

Scrofulous affections of young children.

Nervous, pulmonary, or cardiac diseases requiring a soothing influence, chronic bronchitis, asthma, Bright's disease. Debility and anaemia of advanced life. Laryngitis and catarrhal affections.

The drawbacks of Ajaccio. Any one who thinks of going to Corsica must not fall into the error of supposing that hotel accommodation equals in style, food, and comfort the luxurious houses on the Riviera, or the advantages of more fully developed health stations. Life in Ajaccio is of a quiet, unpretending mode, free from excitement, and rather dull in amusements—a strict counterpart of the climatic feature—unparalleled calmness.

Should the proposed scheme of building a good hotel, with a garden, etc., ever be carried out, a prosperous future lies before Ajaccio, if only by reason of its comparative freedom from the mistral. Up to the present time enthusiastic writers have rather damaged the place than otherwise by creating exaggerated expectation in the minds of intending visitors. This error inevitably leads to disappointment everywhere, and leaves a place with a debased reputation each season.

The means of communication with the Continent are quite second-rate, and the fare very high for the poor accommodation offered.

The drainage of Ajaccio is certainly not perfect, but zymotic diseases are very uncommon.

There is one point I should wish to refer to concerning not only the houses in Ajaccio, but those along the Riviera as well. For economical reasons, brick tiles are adopted as flooring in many of the hotels. This is a most unhealthful and pernicious system of architecture, for the floors so constructed strike a chill to the lower extremities, and by the radiation of heat from the person to the colder pavement, produce rheumatic pains of the ankles and knees, pharyngitis, and enlarged tonsils. I am not sure if the prevalence of scrofulous corneitis, and a granular condition of the eyelids, so common in Ajaccio, is not dependent in some indirect manner upon the dampness and chill of the tiled floors in use in all the houses of the town, even to the topmost bedroom. It is a condition which, in cool or rainy weather, is so chilling to the feet, even with carpets, that chilblains are produced.

The chief diseases of the natives are scrofula, intermittent fevers, articular and muscular rheumatism, and phthisis, which the inhabitants of the towns do not escape.

With respect to cleanliness, there is nothing to complain of in the hotels, but the town itself is one of the dirtiest. The authorities are most anxious in sentiment to attract visitors, but in action they do nothing, so one of the best European climates is lost to invalids. Its only title now to the fame of a health-resort lies in the climate solely. Invalids, however, cannot live on climate alone.

I cannot close these remarks without referring to the delightful excursions that can be made at the end of winter, or

during the spring, to the interior parts of the island. Contrary to many reports, travelling is perfectly safe, and obliging natives are encountered wherever a stoppage is made. The murderous vendetta, of which one hears always, is still carried on throughout the country, in spite of all steps taken for its repression. A feud between two families sometimes ends in a series of murders extending over years, until only one individual is left. In spite of this savage blot on the Corsican character, the natives themselves are kind and well disposed toward strangers ; hospitality is offered frequently without expectation of any pecuniary gain.

Corsica is an Italian island, but has belonged to France since 1768.

OCEAN CLIMATE.

By M. CHARTERIS, M.D., of Glasgow, Scotland.

THE therapeutic considerations of most importance in a change of climate undoubtedly are, (1st) pure air, free from dust and organic particles ; (2d) abundance of sunshine ; (3d) equability of temperature ; (4th) absence of very hot and very cold winds, or at least only a short duration of these.

These four elements should be present in each of the subdivisions of climate which a therapeutic classification renders necessary—viz., of the seaside, the mountains, the inland woodland districts, and the open sea.

It is not my intention to speak of the first three mentioned, but to confine my attention to the last one, with which from many circumstances I am most familiar.

In doing this I shall, first of all, point out some of the great advantages of a sea-voyage and then make a few comments upon the drawbacks, the hardships, or disadvantages, which are certainly with some truth made against it.

ADVANTAGES.—The air of the sea is absolutely pure on deck where, in fine weather, the greater portion of the day is spent. It is also equable. Sudden changes of temperature upon the high seas are very rare, and no chill is felt at sundown. This equability is not depressing, for the constant prevalence of refreshing breezes, laden with saline particles in suspension, renders it a valuable and most invigorating tonic.

Granted, then, that we have an atmosphere pure and equable, great advantages in many diseases may be predicated from a sea-voyage carefully selected and of considerable length.

But before recommending its adoption certain idiosyncrasies have to be considered, the chief of these being sea-sickness. For this we have no specific, although careful dieting before and after sailing do much, in many cases, to prevent its occurrence. A person fond of the pleasures of the table, and who has taken a hearty meal before or after leaving land, will

invariably succumb for a longer or shorter period, and in his despondency audibly and volubly declaim upon the hardships of the sea. He forgets that he is simply paying the penalty of disregarding dietetic rules, and that the sea, like a stern parent, is inflicting upon him the punishment he deserves.

But we must remember that errors of diet will not alone account for sea-sickness—some stand the sea well, some badly ; and it is a prudent step to advise any one for whom we consider a sea-voyage desirable to take a short experimental trip in a coasting steamer, and from it to judge of his or her fitness to undertake a long voyage. If this test should be unsatisfactory, if there be great prostration and timidity, a long voyage would only accentuate evil and do more harm than good ; but if there be complete immunity from, or only very little sickness, then the advisability of the voyage is so far secured.

The next point is to consider the time of the year suitable for starting. The proper time for leaving Great Britain is at the beginning of October, and the return voyage should be so arranged that the arrival home should be about the middle of April. Certain companies of steam or sailing vessels afford considerable facilities for carrying out the objects in view, and grant return tickets at reduced rates to Melbourne or Sydney. On the arrival of the steamer at either port, it is not advisable for the patient to remain in town, on account of the heat and the dust storms prevailing at this time of the year, but rather to proceed to Tasmania, or the Riverina of New South Wales, or the Darling Downs of Queensland. Amid delightful surroundings, a few weeks can thus be profitably and pleasantly spent, with little risk of undoing the good of the outward voyage which the homeward trip is intended to consolidate.

On returning in the middle of February there is little chance of unfavorable winds or prolonged fogs, if the route selected is by the Cape of Good Hope or by the Red Sea by way of the Suez Canal and the Mediterranean, or to San Francisco, thence to New York and home.

On the outward voyage the invalid must expect about twenty wet days. The temperatures met with range from 40° to 80° F. The coldest and, perhaps, the most uncertain weather occurring in the North Atlantic or South Pacific Ocean.

CHOICE OF A VESSEL.—The following considerations may be useful in deciding between steam and sailing vessels :

FOR A STEAMER.—As the steamer is not seriously hampered by adverse winds or bad weather, the length of the voyage may be fairly and accurately predicted, and this fact saves much anxiety on the part of friends at home.

AGAINST STEAMERS are the ceaseless reverberations of the screw propeller, the discomforts of steam and smoke on deck, the bad odors from the engine-room, and the shipping of seas when head winds prevail.

FOR SAILING VESSELS there are the advantages of no bad odors, of more roomy and airy cabins; while the lazy motion permits daily exercise on deck.

AGAINST SAILING VESSELS are the fewer number of passengers, the longer and more uncertain duration of the voyage, and the probability of being becalmed for days or weeks at the Equator in a humid, depressing atmosphere of 80° to 85° F.

It is advisable, in making preparations for a long voyage, to remember that the steamer or ship's library is scanty and contains, as a rule, old and well-thumbed books. It is well, therefore, before leaving, to purchase a good supply of light literature, by the reading of which time may be beguiled. It is also indispensable to provide rugs, cushions, a deck-chair, a waterproof suit, and a sponge bath. Thus provided, life on board of a good going steamer proceeds easily and smoothly. There is little friction among the passengers, and each one tries to enjoy the voyage and to find enjoyment for others. Friendships are formed which stand the test of after years, and various deck amusements, as quoits and shuffle-board, wean the invalid from brooding on his own ailments.

For the man who is not seriously ill, but merely run down by overwork, professional or mercantile, a sea-voyage offers an unequalled holiday, and the rest which it gives to the nervous system is nature's antidote to the great or little worries which at times harass and embitter life. His routine existence is changed—no telegram can arrive, no bill has to be met, no duns can harass, and no proof-sheets have to be corrected. Thus, in a trip in the autumn to the United States, by a steamer not too fast or too crowded, he is wooed by the breezes of the Atlantic, and a new physique seems to be acquired, and many fancied and real ailments disappear under a tonic which art can never supply.

DISADVANTAGES.—The disadvantages of a sea-voyage have been depicted by some in gloomy colors, more especially with regard to ventilation and cooking. The evils arising from overcrowding and bad ventilation cannot be extenuated, and no invalid should proceed to sea unless he can be assured of having a roomy cabin to himself, and that the vessel shall possess a well-equipped hospital which is under the care of an experienced and trustworthy surgeon. Complete isolation of the very sick can thus be secured should any one turn seriously ill, or should an infectious disease arise shortly after leaving port.

The question of cooking does not present a formidable obstacle. Persons who expect an invalid dietary should not be counselled to go to sea. They should remain on shore and try some other modes of treatment. To the majority of persons the ship's fare offers wholesome solid food, and in most cases digestion and appetite go together. There is a greater risk from eating too much than too little, and the crowding of meals should be avoided. A substantial breakfast and a good dinner are amply sufficient for nature's wants, with the addition of a biscuit or two before turning in. I may summarize my views by stating that benefit may be derived from an ocean climate in persons suffering from nervous exhaustion and overwork, in impaired convalescence from an acute disease, and in diseases of bones and joints. To these may be added the early stage of hereditary phthisis, especially in a young person. There can be little doubt of the good effected in such instances by a sea-voyage carefully selected and of considerable length. The recuperative powers of nature are aided by exceptional advantages. Weight, if lost, is regained, and the tubercular mischief, as a rule, is permanently arrested. If the disease be advanced to the second stage, all experience testifies that degeneration proceeds more rapidly on sea than on shore, and that the patient, if he reaches land only does this to find a grave far away from the surroundings of friends and home. No matter how anxiously the patient may crave for the trial of an ocean-voyage, his entreaties should be countermanded by the inflexible decision of his medical adviser couched in the kindest but most telling manner. In such cases you may say, *non mutant morbum qui transeunt mare*, and the

same adage may be applied to cases of organic heart disease, to epilepsy, to enlargements of the liver, and to nervous affections associated with despondency or melancholia.

In conclusion, I venture to give a practical suggestion which would minimize some of the objections offered to a sea-voyage. The suggestion is not original, but came out in speaking of these with a distinguished London physician :

" In the future, a steamer suitable as a sanatorium may be so fitted up that it could accommodate easily from one hundred to two hundred invalids, and convey them from place to place independently of the exigencies of time, or even weather. Such a boon would be welcomed by many who cannot spend the winter in this country, and yet dread the cold journey and the cramped surroundings of Alpine health-resorts, and the treacherous mistral of the Riviera. The boon would be enhanced by the knowledge that the invalids would be looked after by a competent English-speaking physician cognizant of their habits and their idiosyncrasies, and who would carry out other therapeutic measures to aid the influence of pure air and an equable climate."

REMARKS ON OCEAN CLIMATE.

By Dr. W. E. FISHER, Pacific Mail S.S. Co., San Francisco.

IT would seem, in reviewing Dr. Charteris's suggestions, that they are referable more to an ocean-voyage made from the British Isles, and would be of more practical advantage to patients resident in the British Isles and nearer the port from whence the voyage is to be taken. To American physicians, the question of importance is to obtain, as Dr. Charteris states, an ocean-voyage with an equable temperature and freedom from high winds nearer home. After quite an extended experience with the Pacific Mail Steamship Co., as surgeon, I am inclined to believe the proneness to sea-sickness is greatly exaggerated, for the following reasons :

1. Patients afflicted with chronic diseases, such as phthisis, dyspepsia, gastric catarrh, etc., are seldom if ever subject to sea-sickness.

2. After the first two days at sea it is rare to find any one sea-sick. The recovery is usually prompt, and the after benefit great. And right at this point I would like to enter a protest. Many of the leading physicians of our larger Eastern cities—namely, New York, Boston, and Philadelphia, are accustomed to send patients every winter to California via the Isthmus of Panama, and it seems to me that they do so without sufficiently acquainting themselves with the character of the climate through which their patients must pass. For a number of years past I have met patients on the steamers from New York to San Francisco, sent by eminent physicians, among whom I might mention Drs. Fordyce Barker, Sands, John T. Metcalfe, of New York; Dr. Bartholow, of Philadelphia—a large percentage of whom stand such a sea-voyage badly. I am speaking now of cases of phthisis—second and third stages.

Many of our Eastern physicians imagine that the trip above-mentioned is a balmy, delightful one for invalids during the winter months. Let us see how it is in reality.

On leaving New York, for the first few days, or, rather, until the Bahama Islands are reached, the invalid experiences fairly bracing weather. From that point to Aspinwall, and thence up the Pacific Coast, during the long twenty-four or twenty-five days' voyage, a distance of nearly three thousand miles, the temperature averages 100° in the shade, and many days rises as high as 105° or 106° . This is during our winter months in the United States, and it is but just to say that many die on the voyage, or succumb almost immediately on their arrival on the Californian coast. A record of several hundred invalids, with advanced phthisis, who have made this sea-voyage, shows a mortality of between 60 and 70 per cent. It would thus seem that physicians should inform themselves thoroughly on the ocean climate through which they are about to send their patients. But while the above-mentioned voyage is not a desirable one for phthisical patients, there are many voyages from different points in the United States which are desirable and beneficial. The voyage from New York to the

Bahamas, a short, four-days' voyage, is a good one. The voyage from San Francisco to the Sandwich Islands, a seven-days' voyage by steamer, or twelve to fourteen days by sailing vessel, is one of equable temperature and freedom from high winds, and is especially suitable to such cases. The same may be said of the summer voyage from San Francisco to Japan, a sea-voyage of sixteen to seventeen days, in the great majority of which voyages calm, smooth seas prevail.

And now, while on the subject of sea-voyages, let me emphasize one of Dr. Charteris's points in regard to dietary.

Never send a patient to sea who is compelled to live on a limited diet, unless he can take the requisite food along with him, a ship being the poorest place in the world where to obtain any special article of diet. More ground will be lost by patients under such circumstances in one week than can possibly be regained in many months following, on shore, even under the most favorable conditions. There cannot be the slightest doubt in the world that a sea-voyage may be, and is, beneficial in a great majority of chronic cases, but it should be a voyage chosen for its especial adaptability to the case in question, and the climate, class of steamers, food, etc., should have the careful consideration of the family physician before he sends his patient on a month's voyage by water, for a lack of information on the physician's part may mean improvement to the patient, and may mean death, whereas positive knowledge would insure improvement.

THE CLIMATE OF NEW MEXICO AS VIEWED BY THE MEDICAL FRATERNITY THERE.

By DR. JAMES H. WORTH, Albuquerque, N. M.

WHEN I received a communication from the President of this Association, requesting an article upon the climate of New Mexico, the task seemed well-nigh a hopeless one, for the reason that the territory has been largely a blank as far as climatological observations are concerned. Although the oldest settled province of the United States, it was largely a *terra incognita* until the completion of the railroads through its borders, within the last twelve years, rendered it accessible to the rest of the country.

Prior to 1878 meteorological observations were made at the various army posts within the borders, but the abandonment of these, temporarily or permanently, have rendered their tables of but slight importance, and the rush and bustle incident upon the occupancy of a new country have thrown into the background such luxuries of scientific research.

Within the last three years new stations, mainly kept up by the gratuitous service of interested citizens, have been added to the few old ones, and it is to be hoped that within a few years data upon which to base more accurate knowledge will be in our possession. Due gratitude must, however, be shown to the few isolated observers, scattered here and there through the territory, who have enabled us to have a foundation upon which to build, but owing to the interrupted character of these observations it becomes necessary to seek another source of information—viz., the medical practitioner himself and his opinion of the results obtained by watching cases come and go.

For years past New Mexico and Arizona have been recommended as a climate for diseases of the chest; and with the usual liberality of the laity, for all forms and varieties—in fact, for anything that suggested the term “Lung Affection.”

Many came and were benefited, but the journey was long, tedious, and uncomfortable; living was expensive and even then none too good; other places were easier of access and were sought in preference; but now all this is changed; the journey is easily and cheaply made, good hotels are the rule, and the tide of restless health-seekers, in quest of the lost fountain of youth have their eyes turned toward New Mexico, remembering the reports of old and imagining more than the reality.

Twelve years have elapsed since the railroads came, and now let us hear what the practitioner has to say regarding those who have come here. And just here let me say that, as in all emigrations, it is largely the poor and the middle classes who have so far reached New Mexico. The well-to-do and rich are still seeking the comforts that an old established civilization has evolved, and their aim has been to combine with these comforts a climate suitable for their needs. To attain this end they have ransacked Europe, Africa, and America, but up to now New Mexico has deterred them by being unfortunately a "new country."

In view of this the doctors can have their say without any imputation of desiring to "boom" the country. The cases up to date being largely those who, while seeking the country for its climatic conditions have had to depend upon it also for an actual livelihood, and hence, giving it a much more severe test than mere health seeking.

Lying upon the southeastern slope of the Rocky Mountain plateau, New Mexico may be irregularly divided into three districts, an elevated treeless plain to the east, a mountain plateau to the west, and a river valley lying between. Its chief characteristic, modified by local condition, being the dryness of the air. Scattered through these three divisions at widely separated stations are located the physicians from whose reports this article has been made up.

In the circular sent to each, and in addition to the questions relative to population, climate, etc., special stress was laid upon the following questions, viz.:

1. Liability of the native population to phthisis and its fatality.
2. Liability of Americans born in the territory to phthisis.

3. Effect of the climate upon tubercular cases in which no loss of living tissue has occurred.
4. Probability of being able to resume former climate and living.
5. Effect of climate upon similar cases, but in which softening has occurred.
6. What unfavorable conditions exist bearing upon the phthisical?

Naturally the effects of a climate are best seen among the native population, and practice among them soon demonstrates the non-existence of phthisis, which becomes the more marked when we consider their habits of life, their total disregard of any care, and their social condition. In forty returns but four reporters mention cases of phthisis occurring in native population, and in many of these there has been a history of infection.

Four cases occurred in women either wives of or cohabiting with phthisical Americans, and of the others no definite information can be obtained beyond the fact that the cases were not above the suspicion of a specific taint.

The only case of my own was well marked, fatal as to issue, but, occurring in a common prostitute, other causes can be assigned.

One reporter practising twenty-two years sends in three cases, another practising thirteen years sends the same number. And the total number sent in by forty observers amounts to fourteen cases, the course of which in no way differed from that of phthisis among Americans.

In view of the fact that the majority of these cases occurred in towns, and as the statements of the reporters show, mainly in cases where the moral element was decidedly wanting, the probability of infection may be strongly urged.

2. No cases of phthisis occurring among Americans born in the territory have been reported.

As many of the children born of parents who came here in the early days have now reached manhood, and as many of these parents came to New Mexico "for their health," this fact is significant.

3. In such cases when tubercular taint exists, but where no loss of lung tissue has taken place, there is a unanimity of

opinion that the disease has uniformly been checked, and, as far as can be done, in some instances cured. At all events the entire feeling of the profession is that of general, decided, and lasting benefit. The expectancy of life is largely increased and the actions of life more readily performed by reason of the increased vitality and consequent suppression of the symptoms of the disease. In the majority of cases a total cessation of the trouble is seen, and to such an extent as almost to warrant the statement of cure.

Regarding the possibility of a return of a patient to his former home and life, the general opinion is one of disfavor. Some restrict this privilege to certain classes, while others discourage it entirely. While unwilling to deny the possibility of some cases returning home, the feeling runs through all the answers that it would be taking an unnecessary risk.

Regarding the fifth inquiry, the results obtained from cases in which loss of lung tissue has occurred seem to indicate a belief that progress is in direct proportion to the amount of lung tissue destroyed, although the effect of high temperature, heart affections, and an excitable nervous system in connection with a moderate loss of lung substance have not been overlooked in the replies.

Physical examination has shown that cavities have cicatrized, and even considerable loss of lung tissue has been compensated, and that when the preceding complications can be excluded that the patient will do well, provided he be able to live largely out-doors. This depends upon the effort he himself makes, as there exists no climatic reason for not so doing.

Softening with hemorrhage is not itself a contraindication, unless accompanied by a marked hemorrhagic diathesis; in fact, some of the cases in which the best results were obtained have been those whose attention was first called to the lung lesion by a hemorrhage; cases in which the respiration is markedly embarrassed in lower levels, do not do well, a fact common to all high altitudes.

The unfavorable conditions existing are those common to all high, dry altitudes, *e.g.*, rapid changes of temperature from day to night and occasional southeast winds.

The rapid changes of temperature are unfavorable only in the lack of ability of the patient to guard against them, and

necessitate only a little extra care regarding clothing and habits, a care which from some unknown reason the average phthisic finds difficult to perform.

The winds occurring chiefly in winter, and having a season of their own, mainly February and March, are directly a benefit rather than a detriment to the consumptive; while they necessitate his being housed for part of a day, they freshen and invigorate the air—so much so that the exhilarating effects are immediately perceptible. In the sheltered mountain cañons their effects are felt but slightly, if at all, and even in the valley and plain there is an absence of the depressing effects of the moist eastern winds. During their passage across Texas they have parted with their moisture, and make their appearance in New Mexico as a thoroughly dry, cool wind. Records of United States Army posts available to the profession at large, show that they have not produced any increase of respiratory troubles, and that, on the contrary, they have acted as a general tonic.

Such, briefly expressed, are the opinions of the medical fraternity in New Mexico. Physicians who have been in the Territory for years prior to the coming of the railroads, who have seen cases for a greater or longer period and by reason of the limited number of Americans here, have been able to trace them for at least fifteen or twenty years.

The very accessibility of New Mexico at present is a drawback to many cases. Formerly the journey from Kansas City, or Independence, Mo., occupied the greater part of two months, and owing to the high rates charged by the stage line the majority of health-seekers came with traders' caravans. In this way the elevation was gradually attained, the diseased lung had time to accommodate itself to the rarefied air, and the heart was not called upon to answer to sudden strain. At present, in the desire to annihilate time, the patient is raised in twenty-four hours from an elevation of nine hundred feet to one of seven, eight, or nine thousand. Hemorrhages similar to those experienced by balloonists are liable to occur, and the lungs are suddenly called upon to perform severe and unwonted exertion—an exertion which even the healthy find disagreeable and hence dangerous to an organ already showing signs of disintegration.

I have often advised patients in the East to take at least two weeks in the journey from the Mississippi to the Rocky Mountains, and have round them able to stand the passage of the mountain passes with but slight discomfort and no signs of hæmoptysis, while others, no worse off as far as physical signs could reveal, would experience painful dyspnoëa and most likely not escape without a loss of blood. If this rule was more generally followed, it is my opinion that the majority of cases would enter a high altitude better fitted for respiratory action and less liable to manifestations of cardiac trouble.

One fact more occurring in my own cases, and one which I regret that I have not the opinion of the profession at my back : cases of acute phthisis—cases which twelve years since when in the East were sent away with a view to remove climatic influence—are not benefited by residence here.

I have now had an experience of ten cases corresponding to acute miliary phthisis, without hæmorrhage, with cough expectoration and rapid wasting of tissues, and in all these cases while the cough and night sweats would apparently disappear, they have steadily lost ground and finally succumbed. It may be that I am prejudiced and unduly so, but when approached by medical friends East regarding such cases, I invariably tell them to stay where they are or to seek localities within reasonable distance of home.

In my own opinion the cases not to be benefited by the climate are :

1. Cases in which the amount of lung tissue left is insufficient for respiration at lower levels.
2. Emphysema.
3. Bronchial dilatation.
4. Phthisis occurring in the aged or persons too weak to take exercise.

For other cases the extreme dryness of the climate, the predominance of sunshine, and the ability to seek within its borders varying degrees of altitude and surroundings, render New Mexico a desirable climate for phthisical patients, provided, however, that the patient himself is willing to assist.

EDITOR'S TABLE.

 ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

THE TRUTH ABOUT VACCINATION.

III.

IN reply to my article in THE SANITARIAN, April number, Dr. Bell asserts that it chiefly consists of reiteration, and then publishes a communication from Dr. S. W. Abbott, Secretary of the State Board of Health of Massachusetts, in which I am accused of "juggling with the facts" and of making false quotations.

I contend that reiteration is both necessary and justifiable to fortify a statement of fact in any discussion, and an examination of my articles will prove that mine consisted of summarizing and supplementing previous statements. But even so, my strongest points are ignored by Dr. Bell, as I will show further on.

An examination of Dr. Abbott's communication clearly shows who is guilty of "juggling with the facts." He admits that his statistics of the deaths from small-pox in Sweden were "made up from data obtained from the Swedish Government." The fact is, they were "calculated" by Mr. Haile, an English vaccination official, and are so recorded. On the other hand, mine are taken from the published reports of Mr. P. A. Seljestrom, a member of the Swedish Parliament, and a firm believer in vaccination until he became convinced that actual statistics did not verify the claims made for it after an official and judicial examination, in which he took an active part. But if Dr. Abbott wished to be accurate, why did he omit from his table the years between 1801 and 1825? Simply because the death-rate during those years had fallen as low as it has ever done since the introduction of vaccination. Admitting, however, that his table is correct, does he not prove too much? In 1825, with only 25 per cent of the population vaccinated, he shows 400 deaths per million inhabitants; in 1839, with 59 per cent vaccinated, there were

575 deaths per million ; in 1851, with 73½ per cent vaccinated, the deaths were 700, and in 1874, with 97 per cent vaccinated, the deaths are again increased to 900 per million living. Add to this the fact that since 1801 the mortality had only once reached the rate of 1874, and that was in 1809—when it was 1007 per million living *—and we have a very different condition of facts from what he would make it appear.

Dr. Abbott's table of "deaths from small-pox in Boston" is another striking illustration of "juggling with the facts." In 1721 the population of Boston was about 11,000, and there were 850 deaths reported from small-pox. Now, it is absurd to argue from this that, had the population been a million, there would have been 77,000 deaths from the disease. But even the doctor's figures show that there were nearly eight times as many deaths in 1721 as there were in 1792. Why does the doctor omit the death-rates for the years between 1792 and 1838? He will say because there were no epidemics in those years. True, but were the epidemics prevented in those years by vaccination, which was not introduced into Boston till 1800, and but little practised before 1838? Even the Massachusetts reports fail to give us figures for the years 1793–1810, inclusive, but we find in 1811 only 2 deaths reported in a population of 34,000, which would be less than 60 deaths to a million living. During the next twelve years there were no deaths, excepting 4 in 1815 ; while for the 28 years from 1811 to 1838 there were only 52 deaths in all, of which 13 occurred in 1837. Again, the doctor omits from his table the epidemic of 1854–55, and also that of 1860, which was more fatal than the one of 1859.†

From 1721 to 1792 inoculation was largely practised in Boston, and many of the deaths from small-pox were among the inoculated cases. In 1778, 29 out of the 61 deaths reported occurred from inoculated small-pox, while in 1792 this number was increased to 165 out of a total of 198 deaths. Now, if we reduce the doctor's figures in the same ratio his deaths from small-pox per million inhabitants would be about 3200 for

* See First Report of Royal Commission, page 112, table calculated by Mr. Haile.

† See Report No. 153, presented to the House of Representatives, March 13th, 1861 ; section on Small-pox, by Dr. Robert Ware, pages 10 and 15.

1778, and 1650 for 1792. This last ratio is 1158 per million less than the deaths reported in 1872, when 95 per cent of the population was protected (?) by vaccination.

Again, in Sweden, Boston, and every other place for which tables have been compiled, it is evident that "small-pox attained its maximum after inoculation was introduced," as admitted by Dr. Farr. The inoculation of a number of persons produced new centres of contagion, and thus spread the disease and increased the mortality where it would not otherwise have occurred.

By the same "juggling with the facts" practised by Dr. Abbott I can make out a strong case against vaccination. Small-pox broke out on the British bark Kelton in Australian waters in November, 1890. Of the 32 persons on board all were vaccinated and many revaccinated, while all were strong, robust men. Nine of those on board took the disease and one died. Now, following Dr. Abbott's methods, we would have 270,000 cases of small-pox and 30,000 deaths in every million vaccinated persons. Remember, doctor, that "juggling with the facts" will work both ways.

Dr. Abbott is as misleading and uninformed regarding Dr. Creighton's article in the *Encyclopædia Britannica* as in his other statements. Dr. Creighton was selected by the publishers of the *encyclopædia* to write on vaccination in consequence of his well-known professional and literary attainments, and began to prepare his article in 1886. While testifying before the Royal Commission he was asked the following questions : "Q. 5584. Up to that time (1886), if I have understood you rightly, you were an average pro-vaccinationist ? A. I was ; I had no doubt of it ; it never occurred to me to question the thing at all. I took it as one of the things I had been taught as a student. Q. 5585. So that the facts which you think tell against vaccination were rather forced upon you in your investigations ? A. They were."* When he submitted his article to the publishers he stated that he was forced to take grounds opposite to the commonly accepted views of the profession. It was then submitted to a number of eminent men in the profession, and on their recommendation it was published without change. The publishers have

* See Second Report of the Royal Commission, page 185.

not "been compelled by public opinion" to give any other statement on the subject. The supplement referred to is published by the piratical American publishers, and is written by Surgeon Preston H. Bailhache, United States Marine Hospital Service, and the article shows that the author has only a superficial text-book knowledge of his subject.

The reader can verify the truth of my statement by writing to the English publishers, or to Charles Scribner's Sons, New York City.

I quote the following from Dr. Abbott : "There is one point in regard to vaccination which has never been answered by the anti-vaccinists, and that is, the effect of vaccination in altering the death-rate at different ages of life." I contend that vaccination is not and never has been a factor in this alteration. Had vaccination alone been relied upon, it would be natural to so claim. Our better knowledge of the contagious nature of small-pox, our rigid quarantine regulations, and the greater facility with which the bulk of the infants and young children can be kept from exposure to the contagion, sufficiently explain both the general reduction of the disease, when there is any, and the alteration in the death-rate at different ages.

Again, Dr. Abbott says : "On turning to my copy of the Registrar-General's Report for 1883 (46th), I fail to find the figures which Dr. Gunn quotes." Look at your report again, doctor, and turn to tables 30 and 32, on pages 62 and 64, respectively. There you will find the total number of deaths for all England and for London, from 1838 to 1883. The figures show the deaths in all England for the 3 years 1838-40 to be 35,833 ; for the 6 years 1841-50 (4 years being omitted), 29,522 ; for the 10 years 1851-60, 41,985 ; for the 10 years 1861-70, 34,212, and for the 10 years 1871-80, 57,046. Again, taking the year 1871, we find 23,062 deaths recorded. The increase of the population was from 7 to 10 per cent, while the increase of small-pox mortality was from 50 to 120 per cent ; yet, in 1871, 97 per cent of the population had been vaccinated. Will the doctor please refrain from "juggling with the facts," and explain wherein lies the protection in these official figures, and at the same time acknowledge that he overlooked these tables and did me an unintentional in-

justice by inferring that they were not in the report quoted by me?

The quotation made by the doctor from the same report is only an assumption which is not supported by a single line in the book. It reads: "Assuming the ordinarily received estimate to be correct, that 1 out of 20 persons, on the average, is unvaccinated, there were, in 1883, for equal numbers living, more than 39 deaths among the unvaccinated to 1 death among the vaccinated." This assumption is untrue, as I shall prove in another article devoted entirely to that subject. But if it were true, what does it prove? All sickly or diseased children are exempt from vaccination, as before stated. These are the children of the poor, who are the prey to any epidemic, and in small-pox they are no exception to the rule. I have a report before me of four cases of small-pox in children under five years of age treated by the same physician. Two were vaccinated and two unvaccinated. One of the vaccinated cases died and the rest recovered. Now, "juggling of the facts" would show that 50 per cent of the vaccinated cases died, while the unvaccinated were protected. Is it not plain that such statistics are of doubtful value? Yet if they are abandoned and we turn to the actual facts, which Dr. Abbott did not find, the case in favor of vaccination falls to the ground.

Dr. Bell thinks that the statistics of Van Sweiten and others, referred to by me, are not reliable. Then why not leave them all out, and base our arguments on the later statistics and the opinions of such men as Dr. Farr.

When the doctor explains the increasing mortality claimed by the National Vaccine Establishment of England, as quoted by me, and also the admission of Dr. Farr that "the disease [small-pox] began to grow less fatal before vaccination was introduced," I shall furnish further evidence of the "juggling with the facts" by which this great delusion is kept alive.

It seems to me that if unsanitary conditions "promote the planting and propagation" of infectious diseases, they must have an important bearing in spreading them, and, in the light of our nineteenth century civilization, it seems absurd, to me at least, to attribute everything to vaccination and nothing to sanitation in the diminution of the small-pox mortality.

If the unvaccinated are in a "constant state of receptivity," why do they not all take small-pox and die; and why do not the vaccinated escape entirely, and go about with a positive conviction that they are absolutely protected? Is it not because it has ever failed, from Jenner's time down to the present day, and because the people know that the doctors are not agreed as to what constitutes effective vaccination? Why should the profession be divided in England in regard to the use of bovine and humanized virus, the majority still adhering to the latter, while in America it is claimed that the bovine alone is fit for use? So long as such differences of opinion exist, why should compulsory laws regarding vaccination be enforced on those who do not believe in it?

The practice is far from being a scientific fact, and its enforcement, even on school-children, is, to say the least, un-American.

ROBERT A. GUNN, M.D.

DR. BELL'S REPLY.

DR. ABBOTT'S contribution to this discussion, in April number, so completely annuls the greater part of the above, as well as the preceding statement of the same matter, that it scarcely seems necessary to do more than again to invite attention to it. The reader will not fail to observe that our proponent continues to urge the greater accuracy of statistics selected by confessed anti-vaccinationists, than the authenticated records of States and nations, made by competent officials for the safety of the people; insomuch that he fails to face Dr. Abbott's statistical table of deaths from small-pox in different countries by age-periods, except by mere opinion, as he has also failed to notice the statistics in March number showing the difference in the death-rate from small-pox in countries where vaccination is compulsory, as compared with other countries where it is optional.

But with the hope that he will not continue to shirk the issue, more evidence of the same kind, of which there is no lack, is here presented.

U. S. NAVAL TRAINING STATION,
NEWPORT, R. I., April 6, 1891.

Editor of THE SANITARIAN :

Enclosed I send you some valuable figures from a paper by

Brouardel. . . . They are authentic and official. (From *Revue Scientifique*, January 24th, 1891.)

C. A. SIEGFRIED, M.D.,
Surgeon U. S. Navy.

These figures speak eloquently in favor of compulsory vaccination. M. Brouardel holds the State responsible for all small-pox deaths, the disease being preventable. In 1835, in Prussia, the small-pox mortality was 27 per 100,000; in 1872, 262; in 1874, vaccination and revaccination having been established compulsorily, the mortality fell to 3.60; in 1886 to 0.39 per 100,000. In 1886, in the German Empire, the total small-pox deaths were 197; in 1887, 168; in 1888, 110.

COMPARATIVE STATISTICS : CITIES OF VARIOUS COUNTRIES.

Cities and Towns.	Population.	Deaths from Small-Pox.	Pro. per 100,000.
198 German.....	10,518,382.....	42.....	0.4
15 Swiss.....	489,164.....	4.....	0.8
28 English.....	9,398,273.....	600.....	6.4
69 Belgian.....	1,910,625.....	181.....	9.5
12 Hungarian.....	856,286.....	102.....	11.9
52 Austrian.....	2,658,612.....	1,440.....	54.2

Comparing the above figures with French cities of over 20,000 population in 1889: 100 towns—Population, 7,449,214; deaths, 2,623; proportion per 100,000, 35.0.

In Germany, in 1888, the following cities had no small-pox deaths: Hamburg, Breslau, Dresden, Leipzig, Magdeburg, Frankfort-on-Main, Düsseldorf, Bremen, Nuremberg, Dantzig, Stuttgart, Chemnitz, Strassburg, Elberfeld, Altona, Barmen, and Stettin.

Berlin.....	1 death.....	0.1 per 100,000
Cologne.....	1 " .. .	0.4 "
Munich.....	1 " .. .	0.7 "
Hanover.....	4 deaths.....	2.7 "
Koenigsberg.....	7 " .. .	4.5 "

ENGLAND.

London.....	9 deaths.....	0.2 per 100,000
Sheffield.....	408 " .. .	127. "

AUSTRIA.

Budapest.....	13 deaths.....	3 per 100,000
Vienna.....	62 " .. .	8 "
Lembourg.....	27 " .. .	22 "
Trieste.....	254 " .. .	163 "
Prague.....	741 " .. .	250 "

ITALY.

Rome.....	83 deaths.....	22 per 100,000
Genoa.....	136 "	74 "

SPAIN.

Madrid.....	272 deaths.....	57 per 100,000
Barcelona.....	506 "	203 "

ROUMANIA.

Bucharest.....	100 deaths.....	49 per 100,000
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RUSSIA.

Moscow.....	23 deaths.....	3 per 100,000
St. Petersburg.....	61 "	6 "

In France, for 1886, '87, and '88, the mean annual small-pox mortality, counting towns of over 10,000 inhabitants, was 3260. In all France, 45 + per 100,000. The population of towns in France having over 10,000 (229) is 8,575,575. The total population is 38,218,903, so that it is calculated that the number of deaths from small-pox is about 14,000 each year. M. Brouardel thinks the number of cases and of deaths is, proportionally, quite as large in small towns as in large cities.

M. Brouardel concludes, and appears to make good his contention, that in every year in France 12,000 persons are sacrificed by preventable deaths from small-pox; only 110 in Germany. He also holds that these deaths are mainly from among the producing class, not from among the very young or the very old, as by the following table of deaths in Paris, 1880-89:

Under 1 year.....	902	2,250	3,557
1 to 5 years.....	763		
5 " 10 "	128	1,307	1,649
10 " 15 "	115		
15 " 20 "	402	1,020	629
20 " 25 "	608		
25 " 30 "	699	413	5,619
30 " 35 "	560		
35 " 40 "	460		
40 " 45 "	356		
45 " 50 "	273		
After 50 "	413		
			5,619

Finally, in the German Army (compulsory vaccination and revaccination) small-pox has disappeared. The French Army, in 1888, had 345 cases and 14 deaths.

With regard to the worthlessness of the statistics of Van Sweiten and others, which Dr. Gunn signifies a willingness to drop, the reader will recollect they were brought forward by him. His quotation from the records of the "National Vaccine Establishment of England" is equally irrelevant to the issue, as also his statement which follows the quotation about small-pox not being known in London previous to 1629—sufficiently replied to in April number.

Dr. Farr's observations with regard to the lessening *fatality* of small-pox for an uncertain period previous to the introduction of vaccination, as compared with a former period, are perfectly consistent with the medical history of all epidemic and contagious diseases. With rare exceptions they are now, as they have ever been, characterized by a marked fatality at the time of their first appearance in any community, followed by slowly decreasing violence as they proceed—a condition not uncommonly attributed to a better knowledge of them by physicians. But every observing physician who has had much contention with such diseases knows that extreme intensity at the beginning and diminution from period to period is a common characteristic. In further regard to the relation of small-pox to unsanitary conditions of locality, the statement before made is far from being a mere opinion ; it is a fact, based upon the statistical history of the disease ; the bearing of unsanitary conditions has already been specified. Were it otherwise, Dr. Gunn should be able to identify the common prevalence of small-pox with unsanitary conditions, instead of among unvaccinated communities, whether cleanly or otherwise.

Dr. Gunn certainly knows that, even while Jenner lived, the medical profession became convinced that a single vaccination in infancy was not always protective through life, and especially so since the simplicity of the operation then, as now, frequently incurred its careless performance.

It was only two years after the death of Jenner that Bousquet (*Traite de la Vaccine*), in his detail of the epidemic of

small-pox which prevailed at Marseilles in 1825, showed that of the 40,000 total population of the city, 3000 only had been vaccinated ; of these, 2000 contracted the disease, 20 of whom, or one for every hundred affected, died. Of the rest of the population, 2000 had before had small-pox, but 20 of these also contracted it a second time, and four died—one for every five who took the disease. Of 8000 who had neither been vaccinated nor had small-pox, 4000 contracted it and 1000 died, or one in every four. By this it appears that *one-half* of the non-vaccinated, *one-fifteenth* of the vaccinated, and *one one-hundredth* of the variolated took the disease. But such was the difference in the comparative mortality that, while the variolated part of the population died in the proportion of *one out of every five hundred*, the vaccinated only lost *one out of every fifteen hundred*—*i.e.*, of an equal number of variolated and vaccinated persons, *three* of the variolated died from the second attack for every *one* that died who had been previously vaccinated. Similar results have followed the *study of epidemics* of small-pox everywhere since ; they will be forthcoming in due time.

That all unvaccinated persons do not take small-pox and die of it is doubtless because there are a good many other diseases to which people generally are more or less liable, depending upon their constitutional powers of resistance ; that all vaccinated persons do not escape small-pox is, for the most part, due to the imperfect performance of the operation and the changes which take place in the growing organism from infancy to full maturity, which renders *re-vaccination* necessary ; and “ why should the profession be divided . . . in regard to the use of bovine and humanized virus ” is, in the first place—it *isn't*. Physicians are divided in opinion as to which one of the two kinds of virus is the most certain in its effects and the least subject to contamination. There is *no disagreement* with regard to the effectiveness of vaccination—only with regard to the most certain means of applying it. And it may be safely said, with regard to the medical profession as a whole, which *bases its judgment upon the study of small-pox epidemics*, and not upon the ingenuity of skeptics, who merely deal with figures, *it is the most universally accepted truth the medical profession ever enunciated*.

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

WOUNDS OF THE URETERS IN LAPAROTOMIES often happen in the removal of certain tumors, especially in retro-peritoneal cysts ; intra-ligamentar, extending into the lumbar region, especially if they be of malignant character and involved in the surrounding tissue. In such accidents, if the wound be lateral or partial, an attempt may be made to unite the divided edges by suture ; but if the greater part of the ureter has been torn, mortification may certainly be expected, and it becomes necessary to interfere more actively.

In the case of a woman fifty-three years of age, having a cyst which had extensive adherences, which was quite immovable and was included in the large ligament, M. Pozzi tried to remove it entirely. The separation of the surrounding tissue from the tumor was not successfully accomplished, and he punctured and emptied the tumor and then removed it ; then the enucleation was rendered possible, but was very difficult in the deep parts, on account of extensive adhesions. In the bottom of the cavity were found two large bands adhering to the sack. These were incised ; one was a nerve, the other was hollow—*canulated*—and proved to be the ureter.

Le Progrès Médical states that M. Pozzi disembowelled his patient completely, threw back the intestines on the chest, and found that the urine came from the right ureter ; he dissected the upper end of the severed organ, and made a urinary fistula in the right lumbar region. Besides he ligated the lower portion of the severed ureter near the bladder and tamponed the peritoneum. As previously arranged, a sound was passed from the loins into the right kidney ; another into the lower part of the ureter, which remained in the abdomen ; a third was passed into the bladder. A little urine passed with the sound placed in the retro-vesical cavity. There remained a fistula of the right kidney, which M. Pozzi treated three months afterward by nephrectomy. Finally M. Pozzi recalled the fact that the left kidney supplied the loss of the

right in about eight days. In three months the right fistulous kidney was healed except two small spots, which still remained inflamed. In this case there was no infection, a result due entirely to the careful use of antiseptic measures.

In a note to this report *Le Progrès Médical* remarks that, if another case was ever found in which an operation of this kind was performed, it would be very interesting to make a separate analysis of the urine from the right healthy kidney; of that supplied from the fistula and that of the left kidney, as obtained from the bladder, and to observe what modifications the secretion of each side would present.

THE PREVENTION OF DIPHTHERIA.—Dr. Grancher, in a report presented to the Comité Consultatif d'Hygiène Publique de France, maintains that diphtheritic infection is conveyed in nearly all cases by contaminated clothes or articles of furniture. The disease may arise spontaneously in children whose health has been depressed, especially by measles. This he seeks to explain by supposing that the non-pathogenic pseudo-diphtheritic bacillus of Löffler, which is often present in the mouth in health, may under propitious conditions take on pathogenic properties. The spread of diphtheria may be prevented by precautions directed to the thorough disinfection of articles used by the patient. Experiments have shown that the Klebs-Löffler bacillus is killed at a temperature of 60° C. in a moist atmosphere, but in a dry state will survive a temperature of 98° C. He has found it possible to prevent the spread of the disease in children's wards by the following simple antiseptic precautions: The bed is surrounded by a metal screen; all articles used by the patients are immediately disinfected by being placed in boiling water, containing carbonate of soda (about $\frac{3}{4}$ i to Oi). All linen, clothes, etc., are disinfected by heat, and the floor, bed, and walls are washed with corrosive sublimate solution. The medical attendants and nurses are required to wear blouses over their clothes, which are sterilized daily; they must wash their hands with great care, in acid corrosive sublimate solution, or in a 5 per cent solution of carbolic acid. Special wards should be reserved for cases in which the diagnosis is doubtful.—*Revue d'Hygiène*, December 20th, 1890.

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

COMPILED BY HARRY KENT BELL, M.D.

ALABAMA.—*Mobile*, 40,000: Reports 56 deaths during March, of which 17 were under five years of age. Annual death-rate, 16.8 per 1000. From zymotic diseases, 4, and from consumption, 9.

CONNECTICUT.—For the month of March the Secretary of the State Board of Health reports 1128 deaths in 167 cities and towns aggregating 744,278 inhabitants, showing the temporary annual death-rate for the State to be 18.1 per 1000. The mortality from zymotic diseases was 150, being 13.3 per cent of the total. From consumption there were 122 deaths.

New Haven, 85,830: Total deaths, 132—37 under five years of age. Annual death-rate, 16.6 per 1000.

Hartford, 53,000: Total deaths, 95—22 under five years of age. Annual death-rate, 19.0 per 1000.

Bridgeport, 48,740: Total deaths, 74—19 under five years of age. Annual death-rate, 17.2 per 1000.

Waterbury, 33,180: Total deaths, 49—11 under five years of age. Annual death-rate 17.7 per 1000.

DISTRICT OF COLUMBIA, 250,000: Total deaths in four weeks ending March 28th, 496—166 under five years of age, and 234 in the colored population. Annual death-rate, 25.7 per 1000. From zymotic diseases there were 68 deaths, and from consumption, 72.

FLORIDA.—Second annual report of the State Board of Health for the year 1890 shows marked progress in practical sanitation throughout the State. Efficient quarantine plants have been erected and equipped on Santa Rosa Island, near Pensacola, and on Mullet Key, near the entrance of Tampa Bay, and plants at other important places are in contemplation. A coast patrol has been established against Cuban smugglers of yellow-fever; vaccination has been more generally practised than heretofore; cremation furnaces have been erected

at Jacksonville, St. Augustine, and Tampa; paving and draining of streets are in progress at Tampa and Key West; and excepting *dengue*, at Tampa, which for a brief period caused some alarm, and *la grippe*, the State has been relatively free from epidemics. Considerable progress has been made in the registration of vital statistics, but further legislation is needed and recommended for its efficiency. Further legislation is also recommended to enlarge and define the duties of the State Health Officer, by which he may be enabled to enforce the laws requiring cleanliness in towns for the prevention of disease, and for the appointment by the governor of county health officers as registrars of vital statistics, and for other duties in co-operation with the State Board.

Pensacola, 15,000: Four weeks ending March 28th. Total deaths, 16. Annual death-rate, 13.86 per 1000.

ILLINOIS.—*Chicago*, 1,200,000. During the month of March there were 3405 deaths—1466 under five years of age, representing an annual death-rate of 34.05 per 1000. From zymotic diseases there were 476 deaths, and from consumption, 231.

IOWA.—*Davenport*, 33,715: Total deaths during February, 27. Annual death-rate, 6.24 per 1000.

Des Moines, 53,000: Total deaths during February, 48. Annual death-rate, 10.44 per 1000.

LOUISIANA.—*New Orleans*, 254,000: During the three weeks ending March 21st there were 367 deaths—109 under five years of age and 125 in the colored population. Annual death-rate, 24.99 per 1000. From zymotic diseases there were 49 deaths, and from consumption, 43.

MAINE.—“An Act to provide for the registration of vital statistics” was passed at the session of the Legislature just closed. The act will take effect on the first day of January, 1892. Its provisions are very nearly like those of the New Hampshire law. It will be printed in the Sixth Annual Report.

MARYLAND.—*Baltimore*, 455,427: Reports for the month of March, 729 deaths, of which 241 were under five years of

age, and 174 colored. The annual death-rate per 1000 was 19.23. From zymotic diseases there were 55 deaths, and from consumption there were 94. There were 162 cases of contagious diseases reported.

MASSACHUSETTS.—*Boston*, 448,477: There were reported during the month of March 813 deaths, of which number 227 were under five years of age. Annual death-rate per 1000, 21.75. From zymotic diseases there were 77 deaths, and from consumption, 98. There were 646 cases of contagious diseases reported.

MICHIGAN.—For the month of March, 1891, compared with the preceding month, the reports indicate that measles, whooping-cough, inflammation of brain, and cerebro-spinal meningitis increased, and that cholera-infantum, dysentery, inflammation of bowels, diphtheria, puerperal-fever, typhoid-fever, erysipelas, and remittent-fever decreased in prevalence.

Compared with the preceding month the temperature was slightly higher, the absolute humidity and the relative humidity were nearly the same, the day ozone and the night ozone were slightly less.

Compared with the month of March in the five years 1886-90, membranous croup, inflammation of brain, measles, influenza, cerebro-spinal meningitis, and cholera-morbus were more prevalent, and small-pox, whooping-cough, puerperal-fever, dysentery, cholera-infantum, inflammation of bowels, typhoid-fever, diphtheria, and typho-malarial-fever were less prevalent in March, 1890.

For the month of March, 1891, compared with the average for corresponding months in the five years 1886-90, the temperature was slightly lower, the absolute humidity was less, the relative humidity was about the same, the day ozone was less, and the night ozone was more.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of March, 1891, at fifty-two places; scarlet-fever at seventy-eight places; typhoid-fever at seventeen places, and measles at ninety-eight places.

Reports from all sources show diphtheria reported at six-

teen places less ; scarlet-fever at fifteen places less ; typhoid-fever at fifteen places less, and measles thirty-nine places more in the month of March, 1891, than in the preceding month.

Detroit, 220,000 : Reports for March 371 deaths—90 under five years of age. Annual death-rate, 18.94 per 1000. From zymotic diseases there were 70 deaths, and from consumption, 38.

MINNESOTA.—*St. Paul*, 150,000 : Reports for March 172 deaths, of which 81 were under five years of age. There were 21 deaths from zymotic diseases, and 15 from consumption. Annual death-rate, 13.76 per 1000.

MISSOURI.—*St. Louis*, 460,000 : Reports during March 856 deaths, of which 317 were under five years of age. Annual death-rate, 22.33 per 1000. From zymotic diseases there were 91 deaths, and from consumption, 71.

NEW HAMPSHIRE.—The Ninth Annual Report of the State Board of Health, for the year ending October 31st, 1890, in a volume of three hundred and forty-four pages, reports continued progress in State sanitation. By the continually increasing number of local boards of health, more and more hearty co-operation of the physicians, and by increased public interest in the work of the Board throughout the State, public institutions, almshouses, asylums, etc., have been placed upon a more healthful basis ; pure water supplies are rapidly increasing and supplanting the often heretofore dangerously polluted well ; sewerage and drainage extending ; summer resorts rendered more attractive and healthful by house drainage and cleanliness round about ; school-houses and churches better ventilated ; the highways and by-ways—railroad sanitation included—all show signs of increasing healthfulness.

A few towns there are yet, however, populated by people who have not learned to estimate the cost of unsanitary surroundings in sickness and premature death, or that any responsibility rests upon them for preventable diseases. They plead financial inability without the ability to see the cause of it. They fail to recognize the fact that all sickly communities are poor communities ; and pitiful indeed is the condition

of those who are extraordinarily so by long tolerance, waiting to become healthy and rich amid unhealthful conditions. Surely, of all prospects, theirs are the most hazardous and the least likely to fulfil expectations. To such the Board is giving assiduous attention, hopeful of an efficient local board in every town in the State ere long.

Pulmonary consumption continues to be the most fatal disease, and since its generally recognized contagiousness it is the one to which most attention is given by the health authorities. Categorical circulars have been sent to all the physicians in the State, with a view to eliciting such information as may be made useful for its prevention. The practical conclusions deduced from such reports as have been received are : That the disease, subsequent to the first years of childhood, is acquired and not inherited. That it is liable to appear at any period of life. That there is great danger from the use of tuberculous meat and milk. That *the greatest danger of infection* is from the sputa of the consumptive ; and for this reason, when confined to the house, a spit-cup should be used ; and when upon the street, a handkerchief, to receive the expectorations : to be frequently thoroughly cleansed by the use of boiling water or other disinfectants, or burned, and new ones substituted. No person should occupy a sleeping-room with another who has tuberculosis. The eating utensils of a consumptive should be washed with boiling water, and great care should be exercised against the use of glasses, spoons, etc., used by consumptives, by children, or other persons, before they are thoroughly washed with boiling water. The dejections of consumptive patients, in cases where the bowels are affected, should be promptly disinfected. Perfect cleanliness of the apartments and furniture occupied and used by consumptives should be enjoined ; the bed linen and clothing, towels, etc., should be carefully handled, disinfected, or burned ; *cleanliness*, in its most exacting sense, should be the watchword.

NEW JERSEY.—*Paterson*, 78,358 : Reports for the month of March 154 deaths, of which 58 were under five years of age. Annual death-rate, 23.5 per 1000. From zymotic diseases there were 26 deaths, and from consumption, 20.

Hudson County, 283,850 : Reports for March 695 deaths, of which 278 were under five years of age. Annual death-rate per 1000, 29.3. From zymotic diseases there were 102 deaths, and from consumption, 73.

NEW YORK.—According to the State Board *Bulletin*, the reported mortality for February is very nearly the same as that of February, 1890, and about 1200 greater than the average during this month for the past six years. There were 310 deaths per day ; the increase is in the Western Districts of the State. The proportion of deaths from zymotic diseases is a little larger than that of January. The increase, which is moderate, is in scarlet-fever and diarrhoeal diseases. Of the 127 deaths from typhoid-fever, 52 were reported from the Hudson Valley district, nearly all of them having occurred in Albany, Cohoes, Schenectady, and West Troy, in the two former there being a large increase, the endemic having abated in the latter. The mortality from diphtheria continues to decrease. From acute respiratory diseases there was an increase from 57 per day in January to 60 ; the reports of six years show a usual increase from January through March ; it is now in part due to the moderate prevalence in mild form during the month of epidemic influenza, which is reported as the cause of death from numerous localities. The deaths from consumption have diminished. Mortality reports from 137 cities and large towns, having a total population of 4,300,000, give a death-rate of 21.25 per 1000 annually.

New York, 1,680,796 : Total deaths, 3026—1208 under five years of age. Annual death-rate per 1000, 23.40. From zymotic diseases, 577 deaths, and from consumption, 378.

Brooklyn, 852,467 : Total deaths, 1424—569 under five years of age. Annual death-rate per 1000, 21.72. From zymotic diseases, 243 deaths, and from consumption, 142.

Albany, 100,000 : Total deaths, 203—52 under five years of age. Annual death-rate per 1000, 24.36. From zymotic diseases, 40 deaths, and from consumption, 18.

Syracuse, 88,000 : Total deaths, 103—29 under five years of age. Annual death-rate per 1000, 15.20. From zymotic diseases, 12 deaths, and from consumption, 17.

Buffalo, 255,000 : Total deaths, 443—192 under five years of

age. Annual death-rate per 1000, 22.58. From zymotic diseases, 55 deaths, and from consumption, 43.

Rochester, 138,327 : Total deaths, 206—62 under five years of age. Annual death-rate per 1000, 17.82. From zymotic diseases, 17, and from consumption, 17.

During March there was an average daily mortality throughout the State of 344. In 1890 there was a daily mortality in March of 299; in February, 306, and in January, 398; for the three months in 1890, 334, and in 1891, 321. The extraordinary death-rate of January, 1890, was due to epidemic influenza. Comparing this month with January, 1890, there were 54 less deaths per day; the percentage of deaths from ordinary zymotic diseases was greater, 11.6 to 8.8, the undisturbed rate at this season being commonly about 14.5; from acute respiratory diseases, 21.7 in March, 31.1 in January, the rate for the first two months of the year being 18.8; from consumption, 12.3 in March, 14.2 in January; from diseases of digestive system, 5.7 to 4.4; of the nervous system, the two months under comparison were alike. The only measure of mortality from the influenza is the increase in that from local diseases, especially these noted, since comparatively few are reported from influenza alone. It is seen that although the mortality is much increased, being not less than 1000 greater for the month than it would have been but for the occurrence of this epidemic, it still falls short by at least 50 per cent of the increase caused by it in January, 1890. The typhoid-fever endemic of Albany and neighboring localities has considerably lessened during the month. Whooping-cough and measles prevail in numerous localities, and they show a moderate rise in their death-rate. Scarlet-fever does not continue to increase. The proportion of mortality for all zymotic diseases is considerably diminished because of the increase from the cause noted in all local diseases and in deaths from old age, which latter is especially large. Small-pox has disappeared from Jamestown and Nunda, and there is now none in the State.

New York, 1,680,796 : Total deaths, 3854—1433 under five years of age. Annual death-rate, 27.12 per 1000. From zymotic diseases, 549 deaths, and from consumption, 521.

Brooklyn, 862,155 : Total deaths, 1780—661 under five

years of age. Annual death-rate, 24.30 per 1000. From zymotic diseases, 262 deaths, and from consumption, 212.

Albany, 100,000 : Total deaths, 246—54 under five years of age. Annual death-rate, 29.52 per 1000. From zymotic diseases, 33 deaths, and from consumption, 38.

Syracuse, 88,000 : Total deaths, 104—20 under five years of age. Annual death-rate, 14.15 per 1000. From zymotic diseases, 9, and from consumption, 18.

Buffalo, 255,000 : Total deaths, 488—197 under five years of age. Annual death-rate, 22.9 per 1000. From zymotic diseases, 73 deaths, and from consumption, 50.

Rochester, 138,327 : Total deaths, 180—39 under five years of age. Annual death-rate, 14.00 per 1000. From zymotic diseases, 12 deaths, and from consumption, 23.

NORTH CAROLINA.—The State Board *Bulletin* not received.

OHIO.—*Cincinnati*, 300,000 : Reports for March 576 deaths, of which number 141 were under five years of age. Annual death-rate, 23.04 per 1000. From zymotic diseases there were 59 deaths, and from consumption, 71.

Toledo, 82,652 : Reports for the month of March 135 deaths, of which number 34 were under five years of age. The annual death-rate per 1000 was 19.60. From zymotic diseases there were 19 deaths, and from consumption, 18.

Mansfield, 15,000 : Reports for March 13 deaths, three only of which number were under five years of age. The annual death-rate per 1000 was 10.4. There were but two deaths from zymotic diseases, and two from consumption.

PENNSYLVANIA.—*Philadelphia*, 1,069,264 : Reports for four weeks ending March 28th, 1819 deaths, of which 565 were under five years of age. Annual death-rate, 21.9 per 1000. From zymotic diseases there were 239 deaths, and from consumption, 228.

Pittsburg, 240,000 : Reports 545 deaths during the four weeks ending March 28th, of which 197 were under five years of age. Annual death-rate, 28.79 per 1000. There were 76 deaths from zymotic diseases, and 44 from consumption.

RHODE ISLAND.—The number of deaths reported during March was 424, in a population aggregating 269,848. Annual

death-rate, 18.8 per 1000. There were 38 deaths from zymotic diseases, and 65 from consumption.

TENNESSEE.—The State Board *Bulletin* reports that the principal diseases, named in the order of their greater prevalence, in the State for the month of March, were: Non-contagious diseases—pneumonia, catarrhs, bronchitis, consumption, malarial-fevers, tonsillitis, and rheumatism. The contagious and infectious diseases reported are: La grippe, or influenza, in the counties of Bradley, Cocke, Crockett, Franklin, Gibson, Hancock, Hawkins, Henderson, Henry, Houston, Jackson, Madison, Maury, McNairy, Montgomery, Obion, Overton, Robertson, Smith, Stewart, Sullivan, Wayne, and Williamson. Measles in Bradley, Crockett, Davidson, Franklin, Gibson, Hancock, Jackson, Maury, McNairy, Montgomery, Obion, Polk, Robertson, Rutherford, Smith, Sullivan, Sumner, Tipton, and Wayne. Typhoid-fever in Davidson, Gibson, Hamilton, Hancock, Knox, Rutherford, Shelby, Smith and Williamson. Whooping-cough in Davidson, Gibson, Hamilton, Hawkins, Henry, Jackson, Rutherford, and Shelby. Diphtheria in Hamilton, Henry, and Shelby. Scarlet-fever in Shelby, Sullivan, and Tipton. Croup in Franklin, Robertson, and Rutherford. Meningitis in Knox and Maury. Chicken-pox in Houston. Small-pox (one case) in Shelby.

Chattanooga, 40,000: Total deaths, whites, 19; colored, 30. Annual death-rate, 14.64 per 1000.

Knoxville, 43,706: Total deaths, whites, 38; colored, 28. Annual death-rate, 18.12 per 1000.

Memphis, 64,586: Total deaths, whites, 52; colored, 70. Annual death-rate, 22.56 per 1000.

Nashville, 76,309: Total deaths, whites, 74; colored, 83. Annual death-rate, 24.68 per 1000.

WISCONSIN.—*Milwaukee*, 220,000: Reports for March 404 deaths, of which 187 were under five years of age. Annual death-rate, 22.04 per 1000. There were 62 deaths from zymotic diseases, and 28 from consumption. The cases of contagious disease reported to the Health Department during the month were: Scarlatina, 41; diphtheria, 111; typhoid-fever, 1; measles, 12.

OBITUARY.

DR. PAUL H. KRETZSCHMAR, Supervisor at Large of Kings County, died April 27th at his home in Brooklyn. He was born in Dresden in 1847. He was graduated from the University of Berlin, and came to this country in 1869. He married here and opened a drug-store in 1872. While engaged in that business he studied medicine at the Long Island College Hospital, and became a physician in 1877. He built up a profitable practice. Socially Dr. Kretzschmar was very popular, and was a member of the Oxford, Brooklyn, Hanover, Germania, Constitution, and German-Press Clubs.

At a meeting of the Alumni Association of the Long Island College Hospital, April 29th, the following minute was adopted :

" In the death of Dr. Paul H. Kretzschmar the Association of the Alumni of the Long Island College Hospital has to mourn the loss of one of its founders and most zealous and devoted members. As vice-president and one of its Board of Managers his services have always been at the call of his associates, and none of them has been more watchful of its interests than he. The Association recently testified its appreciation of his worth and the esteem in which he was held by unanimously electing him to the responsible position of president. This honor he regarded as an exalted one, and it was his purpose, if possible, to make the year of his presidency memorable in the history of the Association by a greater progress than it had made at any time in the past, and especially conspicuous by the completion of the Armor Memorial, to which he had devoted his best efforts.

" *Resolved*, That this Association, as a mark of respect to its deceased president, hereby pledge itself to the assumption of the work which he has laid down, and to employ its best endeavors to complete the task which he had undertaken.

" *Resolved*, That this minute be entered in full upon the records of the Association, that it be published, and that a copy attested by the president and secretary be sent to the family of Dr. Kretzschmar.

" J. H. RAYMOND, *Vice-President,*

" HARRY KENT BELL, *Secretary.*"

LITERARY NOTICES AND NOTES.

PRACTICAL TREATISE ON ELECTRICITY IN GYNÆCOLOGY.
By EGBERT H. GRANDIN, M.D., Chairman Section on Obstetrics and Gynæcology, New York Academy of Medicine ; Obstetric Surgeon, New York Maternity Hospital ; Obstetrician, New York Infant Asylum, etc., and JOSEPHUS H. GUNNING, M.D., Instructor in Electro-Therapeutics, New York Post-Graduate Medical School and Hospital ; Gynæcologist to Riverview Rest for Women ; Electro-Gynæcologist, North-eastern Dispensary, etc. Illustrated. Octavo, 180 pages. Muslin, \$2. New York : William Wood & Co.

This work appears to be in every way all that the author promises—an unbiassed estimate of the value of electricity in the treatment of diseases peculiar to women ; not from the standpoint of a specific, but as a valuable adjuvant to therapeutic methods. It comprises the gist of the subject from all credible sources, is abundantly illustrated with excellent cuts of instruments and operative procedures, and is gotten up in the excellent style common to the publishers.

A TEXT-BOOK OF BACTERIOLOGY. By CARL FRAENKEL, M.D., Professor of Hygiene, University of Königsberg. Third edition, translated and edited by J. H. LINSLEY, M.D., Professor of Pathology and Bacteriology, Medical Department of the University of Vermont ; Demonstrator of Pathology and Bacteriology, New York Post-Graduate Medical School and Hospital, etc. Octavo, 380 pages. Extra muslin, \$3.75. New York : William Wood & Co.

A welcome work, surely, to many readers and to the profession generally, for there is no subject upon which a systematic text-book, such as this is, could be more timely. Without any pretence at being exhaustive, it comprises everything calculated to promote a thorough comprehension of the subject in all its details, whether for use in the laboratory or library, and no physician nowadays can afford to be without such a work.

THE DISEASES OF PERSONALITY. By TH. RIBOT, Professor of Comparative and Experimental Psychology at the Collège

de France and Editor of the *Revue Philosophique*. 12mo, pp. 160. Price, 75 cents. Chicago : The Open Court Publishing Co.

This work opens with a somewhat lengthy introduction on the two hypotheses of consciousness, the older one that it is the basis of soul existence, and the more recent theory that consciousness is merely a phenomenon resulting from brain activity, which the author adopts. He discusses the subject in four chapters : Organic, Emotional, and Intellectual Disorders, and Dissolution of Personality. Chapter I. is devoted to a general explanation of the body's general sense or principle of individuation, of cases of double personality through hallucination, of the personality of twins and that of twin monsters, like the famous Siamese. Chapter II. is on emotional disorders, the depressions and exaltations of personality, their alternation in cyclic insanity ; the complete metamorphosis of the personality, sometimes from the vilest to the most irreproachable words and acts in the same person, and *vice versa*, alternately, and finally apparent complete transformation of character, all due to changes in the organism, or rather to different environment. The disorders of the intellect are discussed in the aspect of cerebral dualism with the part played by memory therein, and hypnotism ; and the apparent disappearance of personality in mystics. The dissolution of personality comprises insanity, where a real double personality grows out of the dissolution, one talking to and dealing with the other. Many interesting facts are brought forward, not, apparently, to make a case or sustain a theory, but rather to emphasize, whether so intended or not, the impossibility of the solution by science of the everlasting mystery of the soul as the emanation of divinity, however science may continue to multiply its always interesting discoveries within the field of corporeal and psychic union.

THE SOUL OF MAN. AN INVESTIGATION OF THE FACTS OF PHYSIOLOGICAL AND EXPERIMENTAL PSYCHOLOGY. By Dr. PAUL CARUS. 12mo, pp. 474. One hundred and fifty-two Illustrations and Diagrams. Price, \$3. Chicago : The Open Court Publishing Co.

A deeply interesting book, which deals with the most im-

portant subject that can engage the attention of the thoughtful reader who would distinguish between those who raise clouds to obscure that which is knowable and those who strive to maintain the integrity of knowledge illustrated by facts. "The problem of the human soul is of most vital importance, for every practical work, every success in human life, is a part of its solution," and this problem it is which the author of the work before us attempts to solve ; and not, by any means, from a speculative point of view, or by an analysis of mere theoretical literature upon the subject, but from a scientific standpoint philosophically and ethically. But it is a work to be studied and not merely read. Feeling and motion are described in their relation to all organized structures, and mind or soul-life as the sum of vital activities developed in feeling substance. These processes are traced in their relation to the structure, development, and functional activity of the brain and nervous system of all animals, and to the differentiation of their relation to the soul-life of man and the physiological facts of brain-activity. Next follow chapters on the immortality of the race and the data of propagation ; investigations of experimental psychology, and the ethical and religious aspect of soul-life.

The conclusions arrived at are that modern psychology will influence the religious development of humanity in no less a degree than did modern astronomy. The new psychology destroys the dualistic view of the soul. The soul has ceased to be something independent of and distinct from psychical activity, but is identical with it. The human soul consists of man's feelings and thoughts, his fears and hopes, his wishes and ideals. God is the reality of actual life, whose presence in the universe is as undeniable as the quality of gravitation. He is the world-soul, the creative principle and life of the cosmos. God, as thus presented, is not less, but more than a person ; He is the universality of law, inflexible, immutable, eternal ; the Omnipotent power of All-existence ; a theology which conceives of order and law without a prince and of religion without an object of worship. Such is the soul, the religion, and the God of the Monist.

BOOK AND DAUGHTER'S COUNSELLOR AND GUIDE TO THE ATTAINMENT OF WOMANHOOD, THROUGH OBEDIENCE TO THE DIVINE LAWS OF WOMAN NATURE; INCLUDING SPECIFIC DIRECTIONS FOR THE TREATMENT AND CURE OF ACUTE AND CHRONIC AILMENTS. By M. AUGUSTA FAIRCHILD, M.D., author of "How to be Well." 8vo, pp. 388. Dr. Fairchild's Healthery: Quincy, Ill.

The comprehensive title of this book is fully suggestive of its purpose. It is good proportional with the amount of space taken up with regard to the sphere of woman, the hygienic surroundings of the household, the care of children from infancy up, dress, dietetics, water, sunshine, exercise, and sleep. All these things are treated of from a competent standpoint, and so, too, are many other things, but which are not adaptable to the comprehension of persons devoid of medical education. The treatment of disease is the sphere of the physician. Moreover, the first essential to proper treatment is knowledge of the disease to be treated. The utter impracticability of conveying such knowledge to minds devoid of physiological and pathological knowledge is self-evident. Hence, the portion of the work before us that is good and safe cannot be recommended because of its dangerous combination; apart from such a combination, in a separate volume, it would be a safe and useful guide to those for whom it is intended.

MEDICAL SYMBOLISM IN CONNECTION WITH HISTORICAL STUDIES IN THE ARTS OF HEALING AND HYGIENE. Illustrated. By THOMAS S. SOZINSKEY, M.D., Ph.D., author of the "Culture of Beauty," the "Care and Culture of Children," etc. 12mo, pp. 183. No. 9 in the Physicians' and Students' Ready Reference Library. Price, \$1.25.

Medical symbolism in the arts of healing and hygiene is here treated of in a way well calculated to stimulate professional pride and advanced learning. The blending of religion and medicine at the outset of the latter, justly earned for it the title of "the divine art." It is surely none the less so, in modern times, by the severance of the relation; but it can the more successfully pursue its better way by familiarity on the part of its votaries with the appreciation in which it was held in ancient times, to the promotion of which this book is

a valuable contribution, which should find a place on every physician's table.

FEVER: ITS PATHOLOGY AND TREATMENT BY ANTI-PYRETICS. Being an Essay which was awarded the Boylston Prize of Harvard University, July, 1890. By HOBART AMORY HARE, M.D., B.Sc., Clinical Professor of Diseases of Children and Demonstrator of Therapeutics in the University of Pennsylvania; Physician to St. Agnes's Hospital and to the Children's Dispensary of the Children's Hospital; Laureate of the Royal Academy of Medicine in Belgium and the Medical Society of London, etc. 12mo, pp. 166. No. 10 in the Physicians' and Students' Ready Reference Series. Price, \$1.25. Philadelphia and London : F. A. Davis.

This book is, without doubt, the best summary of the effects and utility of the antipyretic group of remedies recently discovered hitherto published. It is the misfortune of the time that antipyretics have been employed with altogether too little knowledge of the nature of pyrexia, hence it is questionable whether their employment thus far has not resulted in more harm than good. The book before us comprises the pathology of fever, together with a thorough knowledge of the remedies referred to under clinical observation. The results are of great practical utility, and every physician should be familiar with them.

TRANSACTIONS OF THE NEW YORK STATE MEDICAL ASSOCIATION FOR THE YEAR 1890. VOLUME VII. Edited for the Association by E. D. FERGUSON, M.D., Secretary, Troy, N. Y., 8vo, pp. 640.

A volume of much value, replete with papers and discussions on subjects of practical utility, by some of the most eminent men in the profession. For example: Address on Surgery, the Ligature of Arteries, by Stephen Smith, of New York. Discussion on Intra-Cranial Lesions, by Drs. W. W. Keen, of Pennsylvania; J. J. Putnam, of Massachusetts; Charles K. Mills, of Pennsylvania; Charles Phelps, of New York; John B. Roberts, of Pennsylvania; F. S. Dennis, of New York; Joseph D. Bryant, of New York; Thomas H. Manley, of New York; John H. Wyeth, of New York. Ad-

dress on Medicine—Prognosis in Medicine, by John Cronyn, M.D., of New York. Address on Obstetrics, by C. C. Frederick, M.D., of New York. Discussion on Obstetrics, by Drs. S. B. Wylie McLeod, of New York; Ira B. Read, of New York; William McCollom, of New York; J. W. Stickler, of New Jersey; G. T. Harrison, of New York; T. J. McGilli-cuddy, of New York; W. H. Robb, of New York; A. L. Carroll, of New York; A. P. Dudley, of New York. And numerous special papers, reports of cases, and operations of importance to all practitioners.

CONNECTICUT MEDICAL SOCIETY PROCEEDINGS, 1890.
N. E. WORDIN, A.M., M.D., Secretary, Bridgeport, Conn.

A pamphlet of three hundred pages, comprising about a dozen papers and special reports and discussions thereon of practical utility to all physicians. Of those more particularly interesting to sanitarians may be mentioned the address of Dr. Orlando Brown, President, on The Duty of the State in Relation to the Practice and Sale of Medicine. He compliments the State Board of Health and the town boards for much excellent work they have done as conservators of the health of the people, notwithstanding the need of more stringent laws for the prevention of quackery and the sale of medicines. He estimates that the unrestricted sales of patent and proprietary medicines to persons not competent to judge of their properties, and detrimental to the health of the people, amount to not less than a million dollars annually. He urges the Society to use its best efforts to secure needed legislation for protecting the health of the people and elevating the status of medical practitioners. The Disease Theory of Intemperance is the subject of an excellent paper by Dr. W. G. Brownson, of New Canaan. He very justly dwells upon the distinction between the vice of intemperance and disease, and reprobates treatment which tends to encourage the vicious in their effort to shift the responsibility of their own will power to other influences. The essay of Dr. J. M. Kensington, of Middletown, on the Importance of the Early History of Cases of Insanity points out the discreditable fact that in about thirty per cent of the insane admitted into hospitals throughout the country the cause is entered "unknown," and

in a large number of cases the early history is meagre or entirely wanting. Moreover, errors in statistics are serious evils, insomuch that it is well-nigh impracticable to deduce useful conclusions from the record. Hence he urges upon the physicians who sign the certificates upon which the insane are committed, the duty of furnishing the needful histories. Dr. D. Chester Brown, of Danbury, gives a short paper under the suggestive title of "Why is Bacteriology not of more *Practical* Value to the Profession in General?" in which he mentions and briefly describes the use of the needful utensils by which physicians may and should turn to account the progress made during recent years in this practical means of diagnosis and treatment of disease. Several other papers are eminently worthy of particularizing, if space would permit.

TAKING COLD. By F. H. BOSWORTH, M.D., Professor of Diseases of the Throat in the Bellevue Hospital Medical College of New York. Detroit, Mich.: George S. Davis.

This is another of the "Physicians' Leisure Library Series" of excellent books, such as several before noticed, of the same series, published at only 25 cents a volume, by the same enterprising publisher, which every physician should possess.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS FOR APRIL comprises : Treatment of Syphilis of the Nervous System, by Julius Althos, M.D., London ; Railway Injuries, with Special Reference to those of the Back and Nervous System in their Medico-Legal and Clinical Aspects, by Henry W. Page, M.D., England ; Causes and Prevention of Phthisis, by Arthur Ransom, M.D. \$10 a year; \$1 a number. William Wood & Co., New York.

THE SOCIAL SCIENCE LIBRARY: SIX CENTURIES OF WORK AND WAGES—A HISTORY OF ENGLISH LABOR. Number 1, January, 1891. By J. E. THOROLD ROGERS, with an Introduction by Professor RICHARD T. ELY, Ph.D. 12mo, pp. 175. Price, 25 cents. New York : The Humboldt Publishing Co.

Those who would begin at the beginning of the specially live subject of which this book treats, should not fail to pro-

cure and read it. Its author, James E. Thorold Rogers, M.P., Professor of Political Economy in the University of Oxford, is among the foremost of those who have carefully studied the facts bearing upon the wage question of the people from the earliest times to the present, and this abridgment of much that he has written upon the subject is well calculated to impress the thoughtful mind in the right direction.

THE COLUMBIAN CYCLOPÆDIA is the new name and new form of Alden's Manifold Cyclopædia—the two printed mainly from the same plates, the first in 32 volumes of 800 pages each, the latter in 40 volumes of 640 pages. The excellence of the work, upon which we have frequently before had occasion to remark, is continued. For free specimen pages address the publishers, the Columbian Publishing Co., 393 Pearl Street, New York.

PAMPHLETS, REPRINTS, REPORTS, ETC., RECEIVED.

HOW TO MAGNETIZE, by JAMES VICTOR WILSON, is a pamphlet of one hundred and ten pages, first published in 1847, recently revised and issued by Fowler & Wells Co., New York. Price, 25 cents.

How Should Girls be Educated? A Public Health Problem for Mothers, Educators, and Physicians. Presidential Address at the Eighty-fifth Annual Meeting of the Medical Society of the State of New York, by William Warren Potter, M.D., Buffalo, N. Y.

Extract from Remarks made before the State Sanitary Convention at Pittsburg, May 30th, 1889, by Benjamin Lee, M.D., Secretary of the State Board of Health of Pennsylvania, Philadelphia.

An Analysis of the Statistics of Forty-one Thousand Five Hundred Cases of Epidemic Influenza.—*Ibid.*

Rational Treatment of Uterine Displacements, by Augustin H. Goelet, M.D., of New York.

Hernia, by S. E. Milliken, M.D., of New York.

Experiments with Egg Plants, Bulletin 26, Agricultural Experiment Station, Cornell University, Ithaca, N. Y.

Cincinnati Hospital Report for 1890.

THE SANITARIAN.

JUNE, 1891.

NUMBER 259.

PREVENTION AND CURE OF DISEASE.*

By G. P. CONN, A.M., M.D., President State Board of Health of New Hampshire.

IT is only a few years since, that an apology would have been considered necessary in introducing the subject of prevention of disease in the profession of medicine. Until recently, young men intending to fit themselves to become disciples of Esculapius assembled in their preceptor's office, or in the lecture room, and read or listened to the orthodox teachings on the theory and practice of medicine ; with hard study memorized the anatomical structures of the human body, while *materia medica* and therapeutics received a full share of their attention, for it was expected that medical students were to devote the whole of their time and energy to the great problem of how to cure disease.

It is true that Jenner had made the discovery that vaccination would modify variola, and thereby transform a terribly loathsome and dreaded disease into a mild and comparatively harmless form of indisposition ; but it was also true that by a great many Jenner was considered little more than a crank, and even now there are some people who see in every sickness an infliction caused by Divine Power for purposes of punishment or premonition, while in Europe and America the leaders of the Anti-Vaccination Unions profess to believe that it is contrary to the designs of nature to interfere, or interpose anything so radical as the substitution of one disease to modify or control another.

* Abstract from the report of the State Board of Health of New Hampshire, 1890.

The great advancement in sanitation that has been made in modern times had its inception early in 1855, when Lord Palmerston, moved by the most distressing condition of the sick and wounded in the hospitals of the Crimean army, commissioned Dr. Sutherland, Dr. Gavin, and Mr. Rawlinson to proceed to the Bosphorus and to the Crimea, and to take instant measures for the improvement of the sanitary state of those sadly crowded buildings.

Mr. Rawlinson, a man of sound sense and great practical skill, a genius for direct and positive action, and then in the prime of life, was quick to apply to the appalling conditions with which he was confronted those well-trained abilities which had already marked him and which still mark him as one of the great lights of sanitary engineering.

The order was issued on the 19th of February. In less than three weeks, the work at Scutari was already progressing, and within a month a marked effect was obvious. Then, says Kinglake, came on a change, which, if only it had been preceded by incantations and mummary instead of ventilation, drainage, and a pure water-supply, would have easily passed for a miracle. Down went the rate of mortality, having already been lowered from the terrible February rate of 42 per cent to 31 per cent; it descended in the next two weeks to 14; in the next twenty days to 10; in the next to 5; in the next to 4; and finally, the 30th of June, 1855, to scarcely more than 2 per cent.

This remarkable result was achieved by the physical changes effected by intelligent engineering. It is probably true that it would have been a difficult task to accomplish in civil life during this short period all that was effected with military discipline, for with a mass of people whose first duty is to obey orders, it is comparatively easy to bring about results, arbitrary or otherwise, which would be almost unattainable when dealing with those that require a reason for every action.

Since that period the public mind has become more and more enlightened with reference to the nature of disease. It is more and more apparent that while many affections may not be subject to control, there is, on the other hand, a vast amount of preventable disease, and the conclusion is legiti-

mate that where prevention is possible, prevalence is evidence of criminal neglect. Naturally the public turn to the medical profession for the solution of all questions in which human health is involved, and the province of the physician at the present hour is not only to deal with those that are sick, but also with those who are well. And by so much as a man is more valuable to the State in health than he is in disease, should the State be interested in preventive medicine from a financial standpoint alone.

During these later years hygiene has made great strides, and its possibilities are developing more each year. Sanitary medicine may be far from an exact science, still the rational application of the principles of hygiene and sanitation have wrought such changes in the work of the surgeon and the possibilities of surgery, as to lead the public to expect of the profession deeds that would have been considered daring, and results that would have been deemed unattainable, a quarter of a century ago. The surgeon no longer hesitates to explore the serous cavities, should the nature of the case render it certain that such an operation is necessary for the purpose of a cure or as a matter of diagnosis, neither is such a process considered especially dangerous. The surgeon applies the principles of hygiene to the preparation of his patient, and conducts his operation with due attention to the prevention of sepsis ; while the abdominal cavity, the pleura, the joints, and the cranium are no longer regarded as forbidden fields to the surgeon.

The recuperative power of tissues, when protected from the septic influences of putrefactive micro-organisms, allows the most brilliant results to follow the work of the surgeon, and adds very much to his renown. When we can throw the mantle of Hygeia around the victim of accidental misfortune, and surround his wounds with such sanitary precautions that nothing septic shall touch the abraded surface, then the work of the surgeon will be greatly simplified. So, too, when we can eliminate contagious and infectious diseases from the mortuary reports of the physicians, the average human life will be prolonged thereby. Theoretically speaking, disease of zymotic origin should never find a place in the nosological tables of the physician. Human foresight should recognize the possi-

ble causes of such disease, and provide for their removal and the probability of their recurrence.

Less than half a century ago, a few zealous and patriotic men were regarded as fanatics because they endeavored to save sanitation from becoming one of the lost arts ; they also attempted to prove that a great deal of the mortality among the people was due to causes that were clearly within the province of the same people to prevent.

It is quite true that the fundamental principles of hygiene are as old as the world itself, for the rules and regulations that were incorporated into the Mosaic law, and were made a part of the religious observances of the Hebrew people, have scarcely been improved ; while it may be added that according to the teachings of the Talmud, a great deal that was considered essential to good health and morals in the days of Moses, is in danger of falling into disuse under the present high-pressure system of modern education.

Can anything more deeply concern the individual or the family than the acquirement of the most perfect action of mind and body during so long a period as is consistent with the natural laws of life ? In the language of Professor Parkes, " Hygiene aims at rendering growth more perfect, decay less rapid, life more vigorous, and death more remote." What higher purposes can you find in all the arts and sciences, or that should more nearly touch the hearts of the people ? For with good health every plan seems feasible, and only energy and perseverance are needed to allow it to be successfully executed. Without health, untold riches and widespread influence are but mockery to one with even ordinary ambition.

It is true that the medical profession has a very laudable desire to cure disease, to make the lame walk, the blind to see ; in short, it is their ambition to become proficient in their chosen profession of remedying bodily ills. This is all right ; let us gain all the knowledge that we can in this direction ; let us examine into the anatomical structures of the human system, study their physiological and pathological conditions, thoroughly analyze the clinical and therapeutical elements entering into the pharmacological list of remedies which are brought into notice and recommended for our use in dealing

with disease, for to the masses the science of medicine has as yet special reference to the cure of disease.

To the novice in medicine it may be too early to speak of the little ounce of prevention that is worth a pound of cure. To the young man about to graduate in medicine, it will be unnecessary to add that medicine is very far from an exact science, for his work in office, lecture-room, and laboratory has already prepared his mind for just such plain truths. The practitioner, having graduated with class honors, begins life anew, ready to build up a reputation upon the cornerstone of the knowledge he has treasured up while a student.

The design of the science of medicine being to cure disease, it is not complimentary to our pride, it does not harmonize with our ideas of professional egotism, nor satisfy our ambition to have a patient do otherwise than to recover health. Accident and old age may be considered good and sufficient reasons on which to base a death certificate. The average layman who believes that the physician should cure all other forms of illness is very prone to discuss our professional merits whenever a death occurs in our practice. Therefore we find ourselves making a mental retrospection of the cases we have attended. Our ambition prompts us to expect that several cases of nearly the same type of disease should all recover, yet in practice this does not always follow, and when a careful review of the work is made, consulting the notes with a conscientious consideration of the time and care that were devoted to each case, it is very evident that there were some elements, some invisible and unknown factor in some cases, that did not enter into nor have a depressing influence over other patients.

For the purpose of illustration, let us go in to the sick-room and study the conditions that may obtain in certain hypothetical cases. Let us suppose these cases to be a type of typhoid-fever, such as we so often find in New England; without discussing the origin of the disease, we will accept the circumstances as we find them. The first case we visit is a young man perhaps eighteen or twenty years of age, who has come home from a distant manufacturing town, where he has been engaged in a mill. This building was constructed with a view of securing conditions favorable to the health of

the operatives, being properly planned to secure good ventilation, a dry basement, and plenty of sunlight, and with clean surroundings ; however, the young man, being of a saving disposition and inclined to economize, took room and board in a house near at hand, where the basement was dark, damp, and mouldy. The cellar was used as a store-room for the family, and contained more or less decaying vegetable matter at almost any season of the year ; the first, second, and attic floors were occupied as living and sleeping-rooms by so large a number of people that the space allotted to each one was but half what would be considered necessary for fairly healthful conditions. The surroundings of this boarding-house were such as to show that the family was naturally of a shiftless character, as all forms of filth were allowed to collect in the yard ; slops were thrown out of doors and windows, as best suited the convenience of the family ; the drain from the kitchen sink having become clogged, the overflow was offensive to sight and smell, as it remained upon the surface of the ground. Not very far away was a vault filled to overflowing, while the well, from which the family and boarders obtained their daily water-supply, was situated in such close proximity that the sink-spout, the vault, and the well formed the angles of a small equilateral triangle, the first two points being directly under the watershed of the house and L. A short time previous there had been a mild case of typhoid-fever in this house, that was not removed to the hospital until after the characteristic dejections took place, which were deposited in this same vault without having been disinfected. The season being a hot and dry one, the water in the well was gradually lowering each day, consequently the solids held in solution became more and more concentrated. About this time the earth was treated to a friendly shower, which allowed the surplus from the roof to wash away much filth that had accumulated about the house. Nature thus kindly attempted to accomplish a work in sanitation that human foresight should never have permitted to exist neglected, but as it is no part of nature's work to provide against man's predisposition to shirk responsibility, it need not excite especial wonder that, in carrying away this refuse, some of it was deposited in places still more dangerous to the public health, viz., in the well or water-supply.

If we admit the existence of the typhoid-fever germ, we must also acknowledge that it might easily be transferred through the porous soil to the water of the well. When this is done it need not be long before this germ would find its way to the enteric surfaces of the anatomical structures of those using the water. It is unnecessary to discuss in this place the reasons why all using this water were not made ill. It will suffice our purpose to grant that this young man had lived in this unhealthful atmosphere so long that his system was in a receptive condition, peculiarly favorable to the immediate development of the disease. Now this case was the second one to have been taken ill in that boarding-house, and the attending physician, learning that the patient had a good home a few miles distant, and realizing that one ill in a boarding-house can receive only indifferent care, promptly sent the young man home before he had become too sick to be moved.

Here we are introduced to him, with all the typical symptoms of typhoid-fever, that every physician would recognize at once. But we also find him in an intelligent household, who are ever on the alert to prevent unwholesome conditions from finding an abode about the premises. The cellar is dry, well ventilated, and free from decaying animal and vegetable substances. The outlook from the buildings shows every part of the grounds to be in such a neat and cleanly state as to be welcome to the sight, and not the slightest disagreeable or offensive odor can be detected about the premises. The water-supply is one hundred yards distant from the house and on a much higher level, and is thoroughly protected from possible pollution. Here are hygienic conditions favorable to health, and to its restoration in case of illness. We will leave this patient for the present, and investigate the circumstances surrounding a second one, whom we find to be of about the same age, but apparently more robust than the first.

He has always labored upon a farm, is an energetic, persevering sort of a genius, although not over-careful of himself or his premises. He is one of those easy-going fellows who never seem to have any anxiety about the health of themselves or their families; really he was more inclined to the belief that fate or destiny has much to do with life, health, and happiness, therefore it mattered not that his cellar was

dark, damp, and untidy, nor that the grounds about his buildings were unkempt, unwholesome, and fostering disease germs. It did not disturb him that the water-supply was in danger of becoming polluted, nor that the atmosphere of the house was so contaminated by gases arising from putrefaction going on continuously in and about yards and outbuildings, as to be recognized at once on entering the dwelling from the pure air outside. Nature's prerogative, that to secure and maintain health one must have pure air, pure water, and an uncontaminated soil, finds no sympathy in the mind of such a person. Believing that sickness and death are but tangible evidences of some mysterious dispensation of a higher power, he is blindly content, for had not his father and his grandfather resided on this same spot and under the same conditions, and if it was good enough for them, why should he complain? True, he is the last of a numerous progeny that barely escaped death in childhood from scarlet fever, diphtheria, or some kindred disease, or perished later in life from phthisis.

These are not altogether fancy sketches. Many a professional man realizes in a few months' practice that these are not overdrawn pictures. It may be said that, so far as the symptoms described in text-books are concerned, these cases have much in common, but a tyro in medicine will not hesitate to affirm that in other conditions they are totally unlike. Case 2 seemingly has the advantage of weight and muscular power; yet there is a wide difference in the sanitary conditions of the two homes that constitutes an unknown factor in development of the disease, for case 2, after falling a victim to the fever germ, remained within the circle of infection that was instrumental in the origin of the disease, and it cannot be denied that his natural recuperative power is weighted down by an incubus that so far destroys the tone of the nerve centres that assimilation and elimination can only take place in a feeble manner, and therefore these natural assistants to the physician are of little or no avail.

Now in consideration of the fact that in one case the air the patient breathes, the water he drinks, and the food on which he is to be sustained, are all more or less contaminated, while in the other he has been promptly removed from these un-

healthful surroundings into well-ventilated rooms, with pure air to breathe, pure water to drink, and good wholesome food on which to sustain the body against the depression occasioned by the fever, the prognosis in these two cases must be widely different, else the physician and the friends will be disappointed.

Neither case may prove fatal, for it is a well-known fact that people will live for a considerable period, and even recover when dangerously ill, in places that have serious defects; yet, under such circumstances, we cannot rely upon that assistance from nature, *vis medicatrix naturæ*, which would obtain in a similar case with improved sanitary conditions.

It is not easy to explain why reasonably intelligent people will be so totally indifferent to what constitutes true hygienic conditions of the home and family. Sometimes their actual sanitary state is overlooked in the hurry and bustle of business; in such instances the physician has only to point out the unseen faults, and they will be remedied at once. Among such people the work of sanitation is a pleasure; but when medical assistance is summoned to a family that has been habitually slack in sanitary matters for generations, and that firmly believes that what was considered good by father and grandfather cannot be otherwise than perfect to-day, the task will be environed with many misgivings and discouragements; for the physician is expected to cure the patient, just the same as if surrounded with the most favorable circumstances that hygiene could suggest.

I have a most vivid recollection of a family resembling case 2, which was always an enigma to me, for I could not satisfactorily solve the problem of their manifest indifference to sanitation. This family was noted for its punctual attendance at church on Sundays, and after thus complying with divine wishes, they evidently felt at liberty to set at defiance all ordinary rules and regulations of nature and hygiene. Perhaps that church edifice influenced the head of the house in forming his ideas of healthful surroundings, for he invariably went to sleep in its unventilated and unattractive simplicity, and whenever he sat down in his own home, he did the same; therefore it is quite possible, that, reasoning by analogy, he

concluded that similar effects were produced by similar conditions, and if an edifice erected and consecrated for the worship of God was not an example to follow in architectural work, where should he find a better one? However, the fact still remained that the air, the water, and the soil about his house were thoroughly contaminated, and there was no "mysterious dispensation of Divine Providence" about his sickness, unless it was that it did not visit him sooner. It is true that a physician was often called to his home, for his wife and children were frequently complaining of sore throats and general lassitude; and an undertaker had assisted in the closing scenes of one child that had died of croup, of another that diphtheria had carried away, and of a third that had succumbed to the wasting of marasmus. In the opinion of such people, physicians are to cure "sick folks," and therefore with such environments they change from one medical attendant to another, summoning each to combat disease with skill in medicines, deserted by every helpful force of nature.

However, the true physician will realize that the family is only paying the penalty for outrageously violating the laws of health, and therefore will be quite reconciled to leave it to its idols. It is very true that the human system will bear a great strain upon its recuperative powers, as exemplified in its tolerance of an amount of opium or arsenic that would prove fatal to one not habituated to its use, and the same may be said of the extremes of heat and cold which it will undergo; yet there is a limit to this power of endurance, and in some unexpected moment, when the vital energy has become thoroughly worn out in its conflict with unseen micro-organisms, nature yields from sheer exhaustion, and the patient is left a victim of his own perversity.

The physician must take cognizance of the various hygienic conditions that surround the patient, and sometimes it requires more tact and good judgment to secure a fair portion of "God's best gifts to man," pure air and water, than to select the class of medicines best adapted to the case. This but feebly illustrates the position of the physician, for while he has received an education with a view to assist nature in the cure of disease, how can he do good work in an atmos-

phere of filth, or without the aid of friends and nurses having an intelligent knowledge of sanitation?

As hygiene refers to everything that has a direct or indirect influence upon the health of individuals or communities, the enthusiastic student, after reforming conspicuous evils, will seek for possible causes of disease, when others would not consider it necessary. While he examines the best means to avoid contagion, infection, and pestilence, he becomes convinced that very often sickness is occasioned and disease aggravated by a variety of causes that might easily be removed by an intelligent co-operation of the physician and the family.

Years since, it was said by Dr. Nathan Smith, the founder of Dartmouth Medical College, that in certain diseases like fever, "the duty of the physician was like that of the sea captain in charge of a ship in a gale of wind. He is as utterly powerless to expel the disease as the seaman to control the winds and waves. Yet both can so arrange and manage their charges that the best possible opportunity shall be given for surviving the tempest." The truth of this comparison is generally admitted by physicians at the present time. But suppose the student of hygiene and sanitation can point out from whence the storms arise and declare the laws governing their development and progress, and furthermore show distinctly that they may be tempered in their course, or suppressed in their origin, indeed, actually prevented, may it not be said of him that he controls the winds and waves of disease and death, and is not his position one of incalculable dignity and value to the individual, the community, and the State?

These are the discoveries that advance rational medicine and prolong life. They are not evolved from anybody's internal consciousness, which forms no element in the healing art; but they are deduced from observation, not only at the bedside but from every point about the premises that will yield any information of what the physician and his patient must struggle against and overcome to secure a return to health. We may not always at the first glance see how immensely important these discoveries are, nor do we always note in the constantly fresh recognition of the causes of disease and the means of their prevention our actual rate of progress in sanitary matters. Almost every one to-day will admit

that if two young men, both inheriting that weakness which is sometimes called a consumptive tendency or diathesis, should work, the one in an ill-ventilated shoe factory and the other in a lumber camp in Canada or Wisconsin, the latter will enjoy the longer life and will be less inclined to the development of phthisis. Our grandfathers in medicine did not realize this. They protected persons with such a tendency from the fresh air, fearing that they would take cold, coddled them in feather beds, and imperfectly nourished them, but gave plenty of medicine.

Bowditch and Loomis have demonstrated that many a person with weak lungs can live for a long period if he will consent to reside in an elevated, dry climate and in the open air, and if the products of respiration and secretion are promptly removed. The profession understand many phases of hygiene and its relation to medicine and surgery that were regarded as a sealed book only a few years since; yet as one problem after another is solved, others that have never been imagined appear, demanding an explanation. From this comes a lesson of humility, for in sanitation, as in medicine, no one has yet arrived at perfection. Therefore the student of to-day, although starting from an advanced position as compared with that of fifty years ago, will yet find much that is new, and has many untrodden paths that he may explore.

As the growing perfection of machinery has modified the methods of labor, thus changing the character of wounds brought to the notice of the surgeon, and as the modern high-pressure system of business has created, developed, and fostered passions and various emotional disturbances that present to the physician types of disease infrequent or unknown half a century ago, so in this ever-changing world the student in hygiene and sanitation will find it necessary to be always a student. In hygiene, as in the other departments of medicine, the good will endure through the varying opinions of succeeding years, and the worthless will be rejected; faith will often be rudely shaken to find so much that will not bear the light of thorough investigation, but these disappointments come in every association of life.

There is no royal road that leads to health, nor can it be secured without effort. It has been decreed that only by

labor can one attain excellence, mentally or physically. It is equally certain that health is an entity which cannot be bought with gold nor governed by statutes ; the throbings of a fevered brain will not be palliated by an embroidered pillow nor a purple canopy. International and State lines or municipal boundaries have no terror for an epidemic of small-pox, yellow-fever, cholera, or other pestilence whose subtle presence may be felt in darkest midnight, yet cannot be seen by the light of the noonday sun. The grim monster will demand from affluence an unconditional surrender of all the good things transmitted by heritage, acquired by industry, or accumulated by avarice. Pain and suffering, whether occasioned by accident or ignorance, have no respect for persons. Fame cannot defy the stings of sickness, nor power neutralize the agonies of pain. The renown of many a victory could not diffuse an anodyne influence over the pillow of Napoleon, nor could the laurels of Austerlitz and Marengo defend him from the discomforts and dangers developed by the fogs and malaria of the " lone barren isle."

The study of medicine, unlike that of almost any other branch of art, literature, or science, intends to fit its votary to deal with the life and happiness of men, rather than with their business or their ambitions. The life-work of the physician may lead him to study the organic defects of man himself, rather than the government under which he lives ; yet it is to the laws of the State and nation that he must look for the enforcement of sanitary rules and regulations necessary to secure to every person his inalienable rights to pure air, pure water, and pure soil.

The mental worth of a man is always interesting in connection with his bodily ailments, as an indication of his ability to comprehend the conditions necessary for his physical improvement. The physician soon learns to examine his patient for the inherent or acquired power to resist the invasion of disease, or his ability to meet its varied indications and his certainty to overcome its depressions, rather than to inquire into his social advantages and position. The house and its adornments may have a pleasing effect upon the eye, yet in the sick-room the mind naturally reviews the situation from a realistic rather than an æsthetic standpoint. The possibilities

of bad drainage, insufficient or no ventilation, unwholesome food, or unskillful nursing, have a decided tendency to make one assume the *role* of inquisitor, rather than to accept any general statement that everything is all right.

Glazed and tinted wall paper may be laid so artistically as to add very much to the beauty of an apartment, yet should the occupant of that room develop a sore throat, weak eyes, or some eruptive disease, as well as an irritable stomach, and should an analysis of that beautiful paper show that it required from five to ten grains of arsenic to the square foot to produce this pleasing effect, sound reasoning would dictate that we should educate the special senses less and give more attention to the body. It is unnecessary that a medical student should become a materialist, but he must become a philosopher, else his calling will soon have but little that will charm him in his daily encounter with mysteries defying solution. Our world is large, and in the oscillations of public opinion the pendulum of real progress swings from side to side without leaving any impression to mark its way, and with but little noise to represent the great work all the time going on.

A good student is ever a student. Graduation exercises only serve to stimulate study. That man learns most who is early to realize that a well-balanced mind can only be maintained by a daily and ever-increasing supply of judicious mental effort. Happy is he who always finds the supply equal to the demand, for an aimless existence forms no part of the life of the student. While his work is never completed, he always had a goal before him, and his ambition will not tolerate idleness. Let us all be students, and we shall pass to and fro in this world as the shuttle through the web, occasionally catching a glimpse of the pattern we are helping to weave ; yet our vision is so transitory, the lights and shadows so complex, and the colors so obscure, that it often seems as if we were working upon the wrong side of the texture instead of the right. But the pattern is very large, and each of our lives forms but a single thread running through the whole piece ; hence it is not strange that it often seems distorted and shapeless, nor that our little labor seems lost in the great harmonious whole. Associated and united labor will always accomplish results that would be unattainable by personal effort alone ; and

nowhere is this better exemplified than in the study of medicine and hygiene.

Classwork has its peculiar advantages, for minds, like metals, cannot come in contact with each other without receiving some form of an impression ; the more forcible the contact, the more vivid the imprint will appear.

Mental attrition develops all the latent powers of the brain, sharpens every faculty and quickens the understanding ; therefore comprehension and perception are improved, that which was dim and misty becomes bright and clear, the outlook broadens, the possibilities expand, and bigotry, superstition, and intolerance find no place in the heart of the true student of hygiene and medicine.

WHAT IS COGNAC?—The important question has been raised by a Berlin journal, as to what is "cognac." It appears that in the French district of Charente, the original locality of what is known as real cognac, or French brandy, has during the last seven years produced an annual average of 20 hectolitres, while the annual export by France of liquor known as "cognac" has exceeded seven times this quantity. In trade "cognac" has been usually understood to be a brandy obtained by the distillation of wine, and it was formerly known as a special French brandy of superior quality ; but as now shown by an analysis published by the State Department of Hygiene, it appears that there is no reliable method of distinguishing real brandy distilled from wine from the spurious. A French court has rendered a decision as to the meaning of the word "cognac" in law, which is to the effect that it may be held to include liquor bearing that name not produced in the original locality, and that when labels announce the goods as "cognac" it is not requisite that the contents of the bottle should have been produced in the place mentioned on the label. This leaves the whole matter of French brandy in a most equivocal condition, and the purchasers of what may be called French brandy cannot be at all certain that they will get what they suppose they are buying.—*National Temperance Advocate.*

RESULTS OF SANITARY LEGISLATION IN ENGLAND, PARTICULARLY SINCE THE PUBLIC HEALTH ACT OF 1875.

By Surgeon C. A. SIEGFRIED, U. S. Navy.

IT is now sixteen years since England first took the lead in passing public health laws, and from the vital statistics published and accessible to everybody, one can estimate the benefit to human existence and the actual saving in human life and money. These results are attracting the attention of sanitarians and statesmen everywhere, and notably in France, where the population is apparently at a standstill, and exercises the serious concern of the publicists in that country.

Up to 1889 the total money cost of all the sanitary works and endeavors of all kinds in England is estimated at \$600,000,000, being a mean annual expenditure of \$43,750,000 for sixteen years. The estimated money value of life preserved is, however, put at \$665,404,025, leaving a clear gain to the nation of over \$65,000,000.

The immediate result of this enormous expense has been a diminution of mortality which is demonstrated with great exactitude. During the years from 1866 to 1875 the mean mortality in England was 22.19 per thousand, as follows :

1866.....	23.4	1871.....	22.6
1867.....	21.7	1872.....	21.3
1868.....	21.8	1873.....	21.0
1869.....	22.3	1874.....	22.2
1870.....	29.9	1875.....	22.7

From 1838 to 1865, when the vital statistics and the deaths were registered not regularly and strictly, the mean mortality per thousand was estimated at 22.35. The rate did not much vary from these figures from 1838 to 1875.

For the ten years from 1880-89, under accurate registration, the mean mortality fell to 19.08 per thousand. It will be observed, by the accompanying chart, that the curve of mor-

tality varied little up to 1875 ; but from that time a gradual fall in the death-rate is noted, continuing to date, as follows :

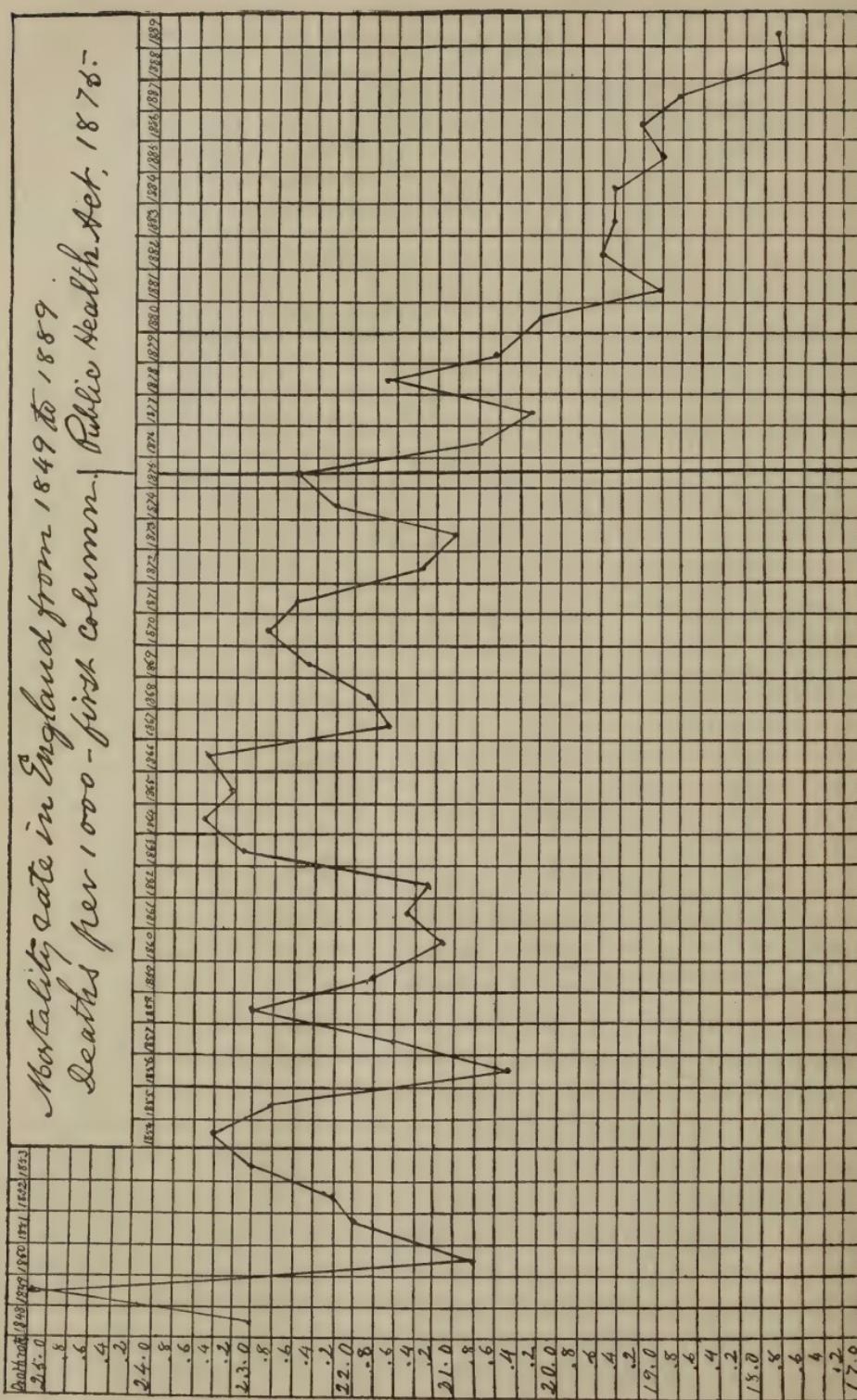
1880.....	20.5	1885.....	19.0
1881.....	18.9	1886.....	19.3
1882.....	19.6	1887.....	18.8
1883.....	19.5	1888.....	17.8
1884.....	19.5	1889.....	17.9

This diminution of mortality is coincident with the development of the sanitary administration ; its wiser vigilance and increased police powers ; improved works and measures, and its more general public acceptance. The money value of life in England is put by Farr at £159 per capita, which estimate is accepted by French sanitarians (3875 francs) ; that is, the minimum productive or earning capacity of each man, woman, and child in the country. It must be remembered that among the diseases much checked, typhoid-fever and small-pox take most victims from the working classes, and the former disease mainly adults. If now we calculate the mortality rate for the decade 1880-89, as compared with that of the decade 1866-75, the lives saved have been as follows :

1880.....	55,183	1885.....	87,522
1881.....	87,722	1886.....	80,545
1882.....	68,543	1887.....	95,757
1883.....	72,177	1888.....	125,680
1884.....	62,986	1889.....	142,466

—a total of \$858,591, representing a capital of over \$600,000,000. Thus it appears that during the last ten years the amount of money saved has been equal to the whole cost of public sanitation in England since 1875. Aside from this commercial value are the disease and pain avoided, the improved health, and the greater happiness of the people.

Zymotic diseases killed 42.54 per 10,000 from 1861-70 ; 24.52 per 10,000 from 1870-80 ; and 18.02 per 10,000 in the decade from 1880-89. The diminution of scarlatina and typhoid-fever has been very considerable, while measles, whooping-cough, and diphtheria have been notably checked. Phthisis from 1861-70 killed 24.89 per 10,000 ; from 1880-90, 17.36 per 10,000—a diminution of more than 30 per cent. According to Noel Humphreys, of the Local Government Board, in



an article in the Journal of the Statistical Society, the figures for the years 1876-80 prove that the mean duration of life has been prolonged two years for men, and for women more than three years.

A BACKWARD GLANCE AT THE 'PATHIES.—Dr. A. H. AGARD, of Oakland, Cal., chairman of the Committee on State Medicine of the State Medical Society, at its recent meeting said, with regard to pending legislation for the exclusion of quackery : “ However objectionable, these ‘pathyists cannot be retired by legal enactments. It had long seemed to the speaker that a plan might be evolved, rational, just to all parties concerned, and practicable, because formed along a line marked by the past history of medicine. A backward glance will explain : The eclectic is simply an evolution from the ‘herb doctor,’ the ‘steam doctor’ of fifty years ago, an ignorant, arrogant quack ; now he is comparatively an educated person, posing as the great selector of remedies, and prating about it as though the idea was quite a new thing. The old steam doctor, to keep up with the times, has been forced to educate himself, and the process has opened his eyes, until he begins to see some things as they are. Similarly homœopathy, fifty years ago, was paled in by dogmas that no one dared to overstep. Now, it is a well-understood fact that there are few who do not question the truth of these dogmas, and many admit that they have no confidence in them. Yet the trade-mark is still flaunted to catch clientage. A similar condition obtains with all ‘isms in medicine ; they are changing even more rapidly and more radically than we suppose ; more knowledge and breadth of view is enticing them out of the narrow grooves into which they once fitted so contentedly. The trend of all these changes is always in the direction of rational medicine ; the volatile parts of these dogmas evaporate into thin air. If there be found a residue of truth, it is saved up in the great store-house of medical knowledge for after use. The speaker believed that a law requiring of all a thorough education in the essentials of medicine, letting the ‘isms and ‘pathies care for themselves—leaving them to the moulding hand of time, would meet the situation.”—*Occidental Medical Times.*

SHALL THE GOVERNMENT HAVE A DEPARTMENT OF PUBLIC HEALTH?

REPORT OF THE COMMITTEE OF THE AMERICAN MEDICAL ASSOCIATION, AT WASHINGTON, MAY 7, 1891, ON THE QUESTION OF A CABINET APPOINTMENT OF A SECRETARY OF PUBLIC HEALTH.

THE committee appointed to consider the question of petitioning the next Congress on the creation of a Medical Secretary of Public Health, beg leave to present their views, and a resolution, for your adoption.

The undersigned believe that the time has come when the medical profession is under solemn obligation to seek all the places and positions in the State that will promote a higher degree of public usefulness than we now enjoy. There is no other profession that excels ours in positive efficiency to sustain public order, comfort and virtue. We possess vast capacity for the direction of society and promotion of human happiness. There is nothing in the body or mind of man that is not in the purview of medical practice. We are laboring unceasingly to assuage the ills of individuals and communities.

At this time the profession is manifesting, in a higher spirit than ever before, the purpose of suppressing contagious and infectious diseases. This work was begun by Jenner a century ago, and the awful scourge of small-pox has been stamped out wherever vaccination is compulsory. We have now assumed the stupendous task of suppressing all the terrible diseases that desolate the world.

There are infectious and epidemic diseases that move about the world, almost periodically, which we need not particularize; they are often the products of the squalor and wretchedness of peoples, and are spread far and wide about the lines

of commerce. These invisible foes infest the air, the waters, and the very food we eat. From the grosser foes of human health, cold, heat, and tempest, men have power to defend themselves : but in regard to these invisible agents of suffering and death, for want of higher knowledge, they are largely helpless. In their despair they turn to medical science for help, unwilling to trust in the brute law of the survival of the fittest.

Governments, in a certain way, have always done something to aid medical men in their endeavors to stay the pestilence and save the afflicted ; but never adequately. They have generally refused to make the medical profession a permanent integral part in the administration of the State ; that is, in the making and the execution of sanitary laws.

What laws are necessary for the full employment of our beneficent profession ? We reply : those that relate to the social state of the people for the prevention of disease. They comprehend an amplitude and purity of water supply, proper dwellings for the lower classes without overcrowding or deficiency of light and air, unadulterated food, complete drainage and disinfection of excrement, the preservation of rivers and smaller streams of water from pollution, the regulation of the hours of labor, the protection of childhood from the imposition of toil, and their proper education, cleanliness of streets and planting of shade trees for protection from intense solar heat, and the decomposing power, by their leaves, of deleterious gases and miasms ; the establishment of public baths, the operations of quarantine to prevent invasion of pestilence and landing of immigrants with diseases dangerous to others, the isolation of persons attacked with infectious disease and the disinfection of localities, the construction and management of general and special hospitals, the care of the sick poor in their homes, the prevention of consanguineous marriages and of those who have destructive types of constitution, the warning of society of the evil consequences of abuses of the brain, the material basis of consciousness, whereby a free will is impaired and the sufferers become irresponsible and are often mentally ruined ; and, lastly, the regulation of those two giant evils of civilization, intemperance and prostitution.

We affirm that all the measures for public relief on these important subjects should be under the guidance of medical men.

It is not the mere knowledge of the human frame as a diseased thing, or a mechanism, that should give us highest consideration in the State, but rather our capacity to prevent sickness by securing the proper administration of the laws of health. At present we occupy positions but little better than mere advisers to authoritative bodies ; our soundest suggestions are at the mercy of ignorance and prejudice of uninformed legislation. The medical profession holds itself ready not only to diminish the fearful destruction of life now going on, but ultimately to destroy the contagia that cause it. It is now becoming generally known that infectious diseases and toxic elements are disseminated in food. An infectious disease in the family of a dairy-man may be as widely diffused as his distribution of milk. The pollution of streams of water and wells about towns, villages and farmers' homes, we know definitely, subject many families to tedious and destructive diseases, which our wise sanitation can overcome, if we possessed the power to so act. It will be well for the State when the medical profession is represented in the councils of the nation as weightily as can be assumed by official places and conferred dignities.

It seems to your committee that this is a propitious period for entering upon a forward movement that will place our profession in its true relation to public affairs ; and that the first and most important step to obtain this end, is to appeal to Congress to create the office of a Medical Secretary of Public Health.

The latest addition to the Cabinet of the President is that of Secretary of Agriculture, and already a great impulse to higher intelligence has been inaugurated by the practical farmer who is at its head.

What part will a Secretary of Public Health play, when he takes his place in the Cabinet ? Will he be a mere figure-head, or will he be able to fulfil important duties to the State ? The answer is, he will, by virtue of his position, justly form an integral part of the councils of the State ; he will represent the medical consciousness of the nation, and be one

to whom we all can look for the exploitation of measures that will direct continuous scientific and collective investigation, in regard to endemic as well as epidemic diseases that afflict the people; he will be able to co-operate, co-ordinate, unify and utilize, in the discharge of his duty, all the work of State Boards of Health, now so well organized in various States of the nation; and these in turn will find themselves strongly reinforced by the example and authority of a great central officer who will be equal in function and opportunity with the other members of the President's Cabinet.

It must be acknowledged that the Government, through the operations of the Surgeon-General of the Army, Navy, and Marine Department, and by the action of the Secretary of State, has authorized most liberal expenditures for the establishment of the National Medical Library and Museum, the issue of the incomparable *Index Medicus*, and for original researches at home and abroad on the origin and nature of the fearful epidemic brought to our shores by immigrant and other ships. Honorable mention is due to Surgeon George M. Sternberg, of the U. S. Army, for his investigations in regard to yellow-fever, and to Dr. E. O. Shakespeare, of Philadelphia, for his study in India and Spain of Asiatic cholera under the patronage of Secretary Bayard; of the establishment of scientific posts by the Surgeon-General of the Marine Hospital Service at Dry Tortugas for the special and continuous investigation of the causes of yellow-fever, and the Bacteriological Laboratory attached to U. S. Marine Hospitals at New York, and to the Surgeon-General of the Navy for the Navy Museum of Hygiene, in whose laboratories chemical analyses of water and food, as well as bacteriological research, are constantly going on.

The more recent enactment of the Inter-State Quarantine Act, as truly says Dr. Walter Wyman, of the Marine Hospital Service in Washington, marks an epoch in the history of national health legislation. The conventions in the quarantine service, in the last few years, have secured great progress toward a uniformity in quarantine laws in time of epidemic visitation. Also an extensive correspondence has been established by the Marine Hospital surgeon with our consuls everywhere, so that our quarantine service is constantly advised of

the prevalence of epidemics in countries with which we are closely connected in a commercial way.

A Secretary of Public Health, by the aid of associated departments, can be constantly informed of the prevalence of epidemic disease in all the localities of our country, and could give public warning to all who might be exposed to them, and thus the people will be assured that a competent Minister of State surveys the whole field. He will also be able to render important assistance to army, naval, and marine surgeons, by the fact that their respective Cabinet officials cannot be in professional touch with them, as would be a Secretary of Public Health.

We can all recall what this Association accomplished for the elevation in rank and pay of the army and naval surgeons from the lower plane on which they stood. It was not through the active support of the President or his Cabinet ; but it was only due to the appeal of this Association directly to Congress. This same effort is now being made through the British Medical Association to obtain higher rank to the medical arm of the army, and with fair hopes of success.

The question of higher medical education must also occupy a Secretary of Public Health. We all know the great progress on this line that has been made in the last twenty years. A more thorough preliminary education is now demanded by our best medical schools for matriculation ; moreover, diplomas no longer give in some States a right to practise medicine. We need uniform laws on this subject in all the States, and such legislation can be greatly promoted by a Cabinet officer. If it be possible to compass this there should be a universal law that no man or woman or special sect of physicians, regular or irregular, and no specialist shall lawfully practise medicine or surgery until they have given satisfactory proof before a board of examiners that they have had an adequate training in medicine and surgery. In this way it is reasonable to expect that at length a race of physicians will be developed who will secure universal respect because they will be regarded as among the best-educated persons in a community.

The only true way of suppressing quackery among regular or irregular practitioners is by higher education. Thus the

medical profession has gradually unfolded itself in the procession of the ages, and will continue to grow stronger and brighter with the progress of civilization.

It is perfectly plain that a Medical Secretary of State will be as fully employed as any other officer of the State, and his duties will increase all the time. It is a well-known biological law that organs grow to conditions of capacity as they are continuously exercised. The muscular system and all the organs thus increase up to a condition of status; so will the functions of the proposed officer grow broader and stronger in adaptability to the needs of the people and the greater efficiency of our profession, also to this Association, which, whatever it may have achieved, is still upon the threshold of its beneficent mission to our country.

His annual reports will command universal attention, as they will contain everything of importance in medical progress.

Finally, the unification of all things relating to public hygiene in the States through the aid of State Boards of Public Health, will give a solidity and usefulness to the practise of medicine never hitherto attained.

We ask for the adoption of the following resolution:

Resolved, That the President of this Association appoint a committee of five to memorialize Congress, at its next session, on the subject of creating a Cabinet officer to be known as the Medical Secretary of Public Health.

All of which is respectfully submitted.

C. G. COMEGYS, Ohio.

T. G. RICHARDSON, Louisiana.

N. S. DAVIS, Illinois.

On motion of Dr. J. F. Hibberd, Indiana, the report was received and the resolution was adopted.

Committee: Drs. C. G. Comegys, Ohio; J. C. Culbertson, Ohio; W. T. Briggs, Tennessee; J. F. Hibberd, Indiana; and William B. Atkinson, Pennsylvania.

MINNESOTA'S INVITATION TO SMALL-POX.

THE Secretary of the State Board of Health of Minnesota reports, as the result of inquiries he has recently made, that of more than 15,000 school children scattered all over the State, in city, village, and township schools, and of ages from eight to twenty years, at least 70 per cent give no proof of vaccination (*i.e.*, a scar, a certificate, or any memory of its performance). The record is constantly growing, but the per cent of neglect gets no smaller. This fact will be unpleasant news to the most of our readers, but is of too much importance to be neglected, and we give it, unhesitatingly, the prominence it deserves.

What is to be done about it? It would be a matter of little concern to the people, or to executive officers of the State Sanitary Service in any locality, if vaccination was not the protection against small-pox which we know it to be, nor if it could, when properly used, convey, with itself, the infection of a more dreadful disease than small-pox, as is so frequently charged. It is sufficient for our present purpose to state that nothing of that sort has happened in our experience in Minnesota, nor has it ever been stated that it had. How then are we to account for the great and growing neglect of a practice which has been our mainstay against small-pox? It is a fact that the decline began when the charge that humanized vaccine was the means of transmitting other diseases became common, and animal vaccine was proposed as a safe substitute. The production of animal virus became a business, and competition cheapened the quality and the price of the product. Popular faith was easily transferred, and so was a considerable proportion of professional confidence. There are not many physicians in our State who insist upon humanized vaccine and use no other; there are quite a number who prefer it when they can get it, but who are willing to use the animal vaccine as a substitute; but the great majority prefer the last as free from suspicion of transmitting other

disease ; as more readily procurable, and as more acceptable to their clients. It was not long after the general substitution of animal for humanized virus when it was discovered that its operation was sometimes violent ; that it required a larger wound and more virus than the other form, for success ; and that failure was of frequent occurrence, even in the most careful hands. Profession and people hesitated, delayed till necessary, "decided to wait," and for a great variety of reasons, and often for no reason at all, the practice has been neglected, till to-day a large proportion of the school children are unprotected, and it is probable that comparatively few children under school age are vaccinated.

It must be distinctly understood that a very large proportion of this neglect is due to carelessness and indisposition to take the trouble, or to incur the expense and possible sickness of the operation.

There is no real opposition to vaccination as a protection against small-pox, for that is as much an article of popular as of medical faith. Two things are necessary to restore the practice to its proper use. First : That medical men, setting the example of vaccination and revaccination in their own persons and families, urge it upon parents as an important duty which they owe to their children. Second : That they be able to offer a vaccine with every possible guarantee of its purity, protective power, and safety.

Since 1872, when the State Board of Health was organized, there have occurred 79 distinct outbreaks of small-pox in cities, villages, and townships, as also in logging camps in the woods, away from civilization, and with no legal local organization to help us. So varied an experience has called for the use of every known method of dealing with the disease, for prevention, suppression, or control, and has put us in a position to judge of their relative value with no more than illustrative reference to other evidence than that of Jenner himself, and the history of our own work.—*Public Health (Minnesota Bulletin) for March.*

THE NECESSARY PEROXIDE OF HYDROGEN.

READ IN THE SECTION OF SURGERY AND ANATOMY, AT THE
FORTY-FIRST ANNUAL MEETING OF THE AMERICAN MEDICAL
ASSOCIATION, HELD AT NASHVILLE, TENN., MAY,
1890.

By ROBERT T. MORRIS, M.D., of New York.

STOP suppuration ! That is the duty that is imposed upon us when we fail to prevent suppuration.

As the ferret hunts the rat, so does peroxide of hydrogen follow pus to its narrowest hiding-place, and the pyogenic and the other micro-organisms are as dead as the rat that the ferret catches when the peroxide is through with them. Peroxide of hydrogen, H_2O_2 , in the strong 15-volume solution, is almost as harmless as water ; and yet, according to the testimony of Gifford, it kills anthrax spores in a few minutes.

For preventing suppuration we have bichloride of mercury, hydronaphtol, carbolic acid, and many other antiseptics ; but for stopping it abruptly, and for sterilizing a suppurating wound, we have only one antiseptic that is generally efficient, so far as I know, and that is the strong peroxide of hydrogen.

Therefore I have qualified it, not as "good," not as "useful," but as "necessary." In abscess of the brain, where we could not thoroughly wash the pus out of tortuous canals without injuring the tissues, the H_2O_2 injected at a superficial point will follow the pus, and throw it out, too, in a foaming mixture. It is best to inject a small quantity, wait until foaming ceases, and repeat injections until the last one fails to bubble. Then we know that the pus cavity is chemically clean, as far as live microbes are concerned.

In appendicitis, we can open the abscess, inject peroxide of hydrogen, and so thoroughly sterilize the pus cavity that we need not fear infection of the general peritoneal cavity, if we wish to separate intestinal adhesions and remove the appendix vermiciformis. Many a patient, who is now dead, could have

been saved if peroxide of hydrogen had been used when he had appendicitis.

The single means at our disposal allows us to open the most extensive abscess psoas without dread of septic infection following.

In some cases of purulent conjunctivitis, we can build a little wall of wax about the eye, destroy all pus with peroxide of hydrogen, and cut the suppuration short. Give the patient ether, if the H₂O₂ causes too much smarting. It is only in the eye, in the nose, and in the urethra that peroxide of hydrogen will need to be preceded by cocaine (or ether) for the purpose of quieting the smarting, for it is elsewhere almost as bland as water.

It is possible to open a large abscess of the breast, wash it out with H₂O₂, and have recovery ensue under one antiseptic dressing, without the formation of another drop of pus.

Where cellular tissues are breaking down, and in old sinuses, we are obliged to make repeated applications of the H₂O₂ for many days, and in such cases I usually follow it with balsam of Peru, for balsam of Peru, either in fluid form, or used with sterilized oakum, is a most prompt encourager of granulation.

If we apply H₂O₂ on a probang to diphtheritic membranes at intervals of a few moments, they swell up like whipped cream and come away easily, leaving a clean surface. The fluid can be snuffed up into the nose and will render a fœtid oœna odorless.

It is unnecessary for me to speak of further indications for its use, because wherever there is pus we should use peroxide of hydrogen. We are all familiar with the old law "*Ubi pus, ibi evacua,*" and I would change it to read "*Ubi pus, ibi evacua, ibi hydrogenum peroxidum infunde.*" That is the rule. The exceptions which prove the rule are easily appreciated when we have them to deal with.

Peroxide of hydrogen is an unstable compound, and becomes weaker as oxygen is given off, but Marchand's 15-volume solution will retain active germicidal power for many months if kept tightly corked in a cold place. The price of this manufacturer's preparation is about 75 cents per pound, and it can be obtained from any large drug house in this country. When using the H₂O₂ it should not be allowed to come

into contact with metals if we wish to preserve its strength, as oxygen is then given off too rapidly.

H_2O_2 must be used with caution about the hair, if the color of the hair is a matter of importance to the patient; for this drug, under an alias, is the golden hair bleach of the "*nymph's despare,*" and a dark-haired man with a canary-colored mustache is a striking object.—*Journal of the American Medical Association.*

A GOOD SUBJECT FOR PHYSIOLOGICAL EXPERIMENTATION—ONE COUNT ZOROUBOFF.—He is reported by the *Provincial Medical Journal* to be a medical man of scientific aspirations, who has recently been charged with the sequestration of four children of tender age, upon whom he was carrying out a series of experiments of comparatively little value.

In order to test whether children brought up without hearing the human voice would speak, he placed the children in confinement under the charge of a deaf-mute, and they were growing up as he expected. The German law fortunately came to the aid of the children, and they were rescued, though the count escaped deserved punishment, as he had otherwise treated the children with care. He has, however, to provide for the children in the future.

It is suggested that some experimentalist capture the count and carry him off to some secluded place, and there subject him, say, to test the count's power of endurance under the lash, or how little food he could exist on—we think the count would hardly appreciate the scientific value of the experiments; or, if the count had children of his own, he would hardly submit them to the class of experiment he was trying on the unfortunate ones he became possessed of.

The moral sense must be very much perverted when such experiments can be even thought of; and he who, as in this case, appears to be so wanting in moral sense as to exercise such cruelty, is himself a fit subject for the experimentalist to effectually test the human power of endurance under the most trying conditions for the benefit of science.

TRANSACTIONS OF THE SEVENTH ANNUAL
MEETING OF THE AMERICAN CLIMATOLOGI-
CAL ASSOCIATION, HELD AT DENVER, COL.,
SEPTEMBER, 1890. (Continued from page 450.)

THE CLIMATE OF OUR HOMES, PUBLIC BUILD-
INGS, AND RAILROAD COACHES, A LEADING
FACTOR IN THE PRODUCTION OF THE AN-
NUAL CROP OF PULMONARY DISEASES.

By R. HARVEY REED, M.D., Mansfield, Ohio.

WHILE the word climate, in the broad sense of the term, is usually applied to the peculiarities of the seasons of a given latitude, as regards the temperature, moisture, prevailing winds and sunshine, as well as the local influences effected by the cultivation and consequent changes in the soil and its products ; yet, in a more circumscribed sense, it is also just as applicable to the variations in temperature and qualities of the air in our homes, public buildings and railroad coaches, as it is to the more extended area of a country or any particular region of the same. The climate of a country is the legitimate result of certain natural causes, producing consequent effects, which may be modified in a degree by artificial conditions. The climate of our homes, public buildings, and railroad coaches is largely the direct result of artificial causes, followed by their corresponding effects.

When this association was organized at Washington, in 1884, it adopted for its object "the study of climatology and hydrology, and diseases of the respiratory and circulatory organs," and a great deal has been said in its transactions, of the various climates of this and other countries, regarding their good or bad effects on certain diseases. A great variety of opinions have been expressed as to which locality and what particular conditions of climate are most congenial to the restoration of lost health in the greatest number of cases of a given disease. As a rule, a change of climate is seldom sought for the prevention of disease, but more generally for its supposed curative effects, after certain diseases have been contracted.

That the purity of the air, the regularity of the temperature, and the hygrometric conditions of the atmosphere play an important part in the production of a healthful climate and the prevention of certain diseases, stand without a question. That it is better to prevent disease than to cure it, is a self-evident fact.

In order to prevent disease it becomes a necessity that we know at least the chief causes that lead to its production. For brevity and convenience, we will divide all pulmonary diseases into two general classes : First, those of tubercular origin ; second, those of non-tubercular origin. Each of these has its predisposing and exciting causes. Among the predisposing causes of pulmonary tuberculosis are : congenital predisposition, or the so-called tubercular diathesis ; the reduction of the vitality by syphilitic poison, which may often be as remote as the third and fourth generations ; illly ventilated rooms, poor or insufficient nourishment, or prolonged mental depression—any of which leads directly to a general reduction of the vital forces, which soon creates a fertile field, and puts it in a high state of cultivation for the development of a productive crop of active tubercles.

Among the exciting causes of pulmonary tuberculosis are : the introduction into the system of active bacilli from persons suffering from the advanced stages of phthisis ; the incomplete oxidation of the blood by the constant inhalation of impure air ; extreme and sudden changes of temperature ; exposure to draughts of air, and great variations in the moisture of the atmosphere.

In the non-contagious pulmonary affections, the leading predisposing causes are : constitutional weakness, chronic alcoholism, the continual inhalation of air laden with fine dust or obnoxious gases. Age is another cause : the very young and the advanced in years are more apt to contract non-tuberculous pulmonary affections than those in the prime of life. The chief exciting causes of non-tuberculous pulmonary diseases are : sudden and extreme changes of the temperature, the exposure of one part of the body to a very warm and the other to a much cooler temperature, sudden changes from a moist to a very dry atmosphere or the opposite, exposure to draughts of cold air, and the inhalation of impure air.

With these preliminary remarks, we will, first, investigate the climate of our homes, public buildings, and railroad coaches, and try to ascertain in what respect they become leading factors in the production of the annual crop of pulmonary diseases ; and, second, how said causes which lead to the production of pulmonary affections, can be so modified and their climates so improved as to avert to a great extent these disastrous results.

“Our homes” cover a great variety of architecture, all possible shades of comfort, and every imaginable method of heating, from the open fire-place to the most improved air warmers of the age, and from no provision whatever for change of air to complete scientific ventilation. From personal investigations, continued for years in quite a number of our Northern States, I find that but few homes are blessed with perfect methods of heating, combined with complete scientific ventilation. The homes that suffer the most for the want of pure air and proper heating are the tenement-houses and “flats” of our cities ; farm-houses and ordinary city residences rank next, and, lastly, the palatial residences of our capitalists. Time and space will not permit our going into details, and consequently we will confine ourselves to a discussion of the conditions of heating and ventilation found in the average houses of our average citizens, which constitute by far the great majority of “our homes,” and, therefore, cover the “rank and file,” so to speak, of our population.

Among the farmers of our country and the laborers of our cities, the average living room is the kitchen, which seldom exceeds fourteen by sixteen feet, with an eight foot ceiling, giving a total of 1792 cubic feet of air, or scarcely enough of air to supply one adult for two hours. This room usually has from two to three windows, and one or two outside and inside doors, and, as a rule, is located at the rear of the main building, and is generally the poorest finished room in the entire structure. It is usually heated with a common cook stove, and is used for a cooking department, and dining and sitting-room combined. In short, the entire family live in this room, when in the house, except during the sleeping hours. There is no provision for ventilation except by the doors and windows, which are usually very loosely fitted, and furnish numer-

ous draughts of cold air from nearly all sides of the room, while the cook stove furnishes the main exit for the foul air, or rather the chief source of any circulation of air whatever.

Allowing five members as the average of an ordinary family, and one thousand cubic feet of air for each person per hour, the average amount of fresh air which should be supplied, and they will require five thousand cubic feet of air an hour, and consequently would breathe all the air in the room in less than twenty minutes. A room under these conditions, after making a most liberal allowance, would not receive to exceed five hundred cubic feet of fresh air an hour from the cracks in the windows and doors, or but one tenth of the actual amount necessary, unless a door is opened or a window raised or lowered, which is seldom the case, especially when the temperature is low, and when done is a very objectionable method of ventilating at best—particularly in cold weather. The temperature in a room heated and ventilated like this, will vary from 20° to 40° Fahr. between the floor and the ceiling and the more remote parts of the room I have seen water freeze in one part of a room like this, with a red hot stove in the other part, and the thermometer registering 75° Fahr. on the wall, at the level of the head. Again, I have seen as high as 35° difference in such rooms between the head and feet while sitting on an ordinary chair, and yet people wonder how they "catch cold," and contract pneumonia, pleurisy, and acute bronchitis, or suffer from nasal catarrh and frequent attacks of quinsy. Nor is this all. Go with me to the sleeping-rooms of these same people, and here you will generally find an eight by ten, or ten by twelve room, with an eight foot ceiling, or not to exceed 960 cubic feet of air—a scant supply for one person for a single hour—but these rooms usually contain two inmates, and not infrequently three or four. In the former there would be just pure air enough to supply the two persons half an hour. These rooms are seldom heated, and less seldom the windows are either raised or lowered to admit fresh air, which must find its way in around the crevices of one or two windows and a single door. We will make a liberal estimate, and allow one hundred cubic feet per hour for each window and door when closed, which in the case of two windows, would amount to three hundred cubic feet per

hour—less than one third the requisite amount for one person, and less than one sixth the amount for two ; or an average of one hundred and fifty cubic feet of fresh air per hour to each person, with no provision whatever for the escape of foul air, except by the same channels, the doors and windows. Is it any wonder they get up in the morning with headache, and have frequent attacks of throat and lung diseases ? The wonder is there is not more

Let us leave “our homes” for the present, and go to our public buildings, of which the school-house is the most important. It has been my privilege to make personal inspections of hundreds of schoolhouses and scores of churches, court-houses, hospitals, almshouses, jails, several State and provincial capitals, a few penitentiaries and asylums, and one national capital—which, combined, form the basis of my personal information on this part of the subject ; and, with few exceptions, when weighed in the balance with approximately perfect heating and ventilation, they were found wanting.

In the large majority of our public buildings there is a variation of temperature existing in the same room in ordinary cold weather, of from 15° to 35° Fahr. between the floor and the ceiling, and those parts of the room most remote from the heating apparatus ; while the fresh air supply is either inadequate or absent altogether. Generally, there is no provision made for the escape of foul air whatever. Occasionally there is an open grate, or stove with open doors, which allows a portion of the foul air to escape, but usually in these cases there is no provision, outside of the windows and doors, for the supply of fresh air. By the usual methods of steam and hot water heating, there is neither provision for the introduction of fresh air nor the escape of foul air. I have seen scores of school rooms with from forty to sixty scholars in them, and no provision for heating, except a stove, and no provision for fresh air besides an open door, window, or transom ; in which case some scholars must sit in a draught of cold air, others in a part of the room which is too hot, and the rest in a part that is just as much too cold. I have seen scores of school-rooms heated by furnaces which only supplied from two to six thousand cubic feet of “red-hot” air per hour, for forty-five or fifty scholars, or not more than one hundred and fifty cubic

feet of air an hour for each scholar (instead of at least one thousand or one thousand five hundred cubic feet of warm air for each child for the same length of time), without any provision, except the doors, windows, or transoms, for the escape of foul air. Just imagine from six to ten scholars being restricted to the use of only air enough for one scholar, and while being starved for pure air, and tortured by extremes of temperature, their brains being taxed with long lessons and burdensome tests. Is it any wonder that after twelve or fifteen years of this kind of torture, they finally succumb to pulmonary tuberculosis, and fill a premature grave?

Next to the homes and public schools, there are, perhaps, more people living in passenger coaches than in any other class of structures, take it the year round. Let us see what kind of a climate they furnish the great army of the travelling public. After a series of systematic inspections on four of our trunk line railroads, and the inspection of some thirty passenger coaches of all classes, from the smoking car to the Pullman palace coach, I have found a variation of temperature between the floor and the level of the head while sitting on an ordinary seat, in each car examined, which ranged from 12° to 30° Fahr. in first-class coaches. The coach referred to in the first instance was a ladies' coach, heated with hot air, while the temperature outside the car was only 15° above zero; and in the latter case the car was a Pullman sleeper, heated with hot water, with a coil of pipe under each seat and extending around the sides of the car, with the outside temperature 12° above zero. In the coaches heated with common stoves, hot water, or steam, there are no provisions whatever, except the windows, doors, and transoms, for the admission of fresh air or the exit of foul air (except when the stoves are used a little foul air escapes through the stove), and these sources are not only exceedingly unsatisfactory and incompetent, but positively dangerous to the health and lives of the passengers. In the coaches heated by hot air, the supply of fresh air used is not only irregular, but insufficient, and varies with the direction of the wind and the velocity with which the train is running. None of these coaches are supplied with foul-air exhausts, outside of the draught in the stoves, the doors, windows, and transoms.

The average number of passengers found in the thirty coaches inspected, was twenty to a coach, varying from seven to fifty-seven ; this would require an average of at least twenty thousand cubic feet of warmed air to the car every hour, and proportionate exhaustion of foul air to keep the atmosphere of the car in a practically pure condition. We also found from 4.41 parts of CO₂ in ten thousand parts of air, in the summer time, with the doors and windows open, and only eleven passengers in the car, to as high as 18.33 parts in the winter season, with fifty-seven passengers in the coach.

By these series of researches we have found that from the cradle in our homes to the public schools, from the schools to the churches and public buildings, and from the quiet cottage or busy counting-room of every-day life, to the whirling palace car, we are bathed in one continuous impure atmosphere. From the moment they are born until the shroud is drawn around them for their last sleep, the great army of people who live indoors are breathing impure air. They send their children to school, where they breathe and rebreathe the air over and over again. Nay, more, the putrid breath of the syphilitic and tuberculous child is inhaled by the child with rosy cheeks and a sound constitution, from the beginning to the end of the school year. You would scorn the idea of having but one handkerchief, tooth-brush, or tooth-pick for each school-room, and having your children all compelled to use them daily in common with the rest of the scholars, but you sit with folded hands and peaceful conscience while your children violate sanitary laws a thousand times worse, by the inhalation of millions of cubic feet of foul and even putrid air from their diseased classmates, each school year.

Again, the fond mother sits her helpless child on the floor and tries to have it amuse itself with toys, while its whole body is bathed in an atmosphere from 15° to 20° colder than the body of the mother, and then wonders why it cries and is discontented and fretful, and is in a perfect quandary as to how it ever contracted pneumonia. If it survives this it is sent to school and not only bathed in a poisonous atmosphere, but subjected to draughts of cold air from windows and transoms in one part of the room, or overheated in another,

while, as a rule, its feet are bathed in a stratum of cold air from morning until night.

How many of us who in our younger days played the *role* of school-teacher, cannot recall the frequent and familiar plea of "Please, may I go to the stove to warm my feet?" and recall the sickening cough, cough, cough, of the child with "only a cold," or picture the flannel-bound necks of the children with sore throats, and point in our mind's eye to the flushed cheeks and watery eyes of the child with the "splitting headache," vainly striving to get out a lesson for the coming recitation; and yet, with all these melancholy facts staring us in the face, like ghosts from the graves of the martyrs, from bad heating and ventilation, we have gone on and on for years with little or no improvement for the relief of these conditions which cause the death and daily suffering of countless thousands of our rising generations.

Is it any wonder their constitutions are undermined and their health broken down at the age of twenty, and that before twenty-five a large percentage of them fill the consumptive's grave? Is it any wonder that countless thousands of children die of acute lung trouble before they reach the age of five years? Is it any surprise that pneumonia so frequently claims the business man as he turns the age of forty, and hustles him off to meet his God, with scarcely a moment's warning?

Oh! no, my fellow-practitioners, these are only the legitimate results of physical causes and of the direct violation of sanitary laws; and just so long as we continue to heat and neglect to ventilate our homes, our public buildings, and railway coaches as we do at the present time, just so long may we expect to find the annual crop of pulmonary diseases to stand at the head of the mortality list in all our annual health reports. Just so long as cause is followed by effect, and just so long as the great masses of our people are exposed to one continuous bath of impure air, complicated with great extremes of temperature, just so long may we expect consumption to stand at the head of the annual mortality list, and the remainder of our pulmonary diseases, generally, to hold their present rank in mortuary statistics. Iron, cod-liver oil, and foreign climates must yield to common sense and sanitary

reforms in our homes, our public buildings, and railway coaches, first, ere we can hope or legitimately expect to see any reform in the mortuary statistics of pulmonary diseases. We have tried in vain for centuries to "cure" consumption. People by the thousand and hundreds of thousands have flocked from one health resort to another, vainly seeking to free themselves from the lion grip of pulmonary consumption ; they have, figuratively speaking, soaked themselves in cod-liver oil, and clad themselves inside and out, with iron ; they have loaded their poor stomachs with the hypophosphites, and been pumped with the pneumatic cabinet, and injected with carbonic acid gas ; but the end was all the same—it was only a question of time until the funeral knell sounded the requiem of their departed spirits.

These are undeniable facts, and as such should claim not only our attention as physicians and surgeons, but our united efforts in search of relief. The law compels our railroads to guard city crossings, and in many States to stop all trains at junctions, besides a dozen and one other things for the physical protection of passengers. School boards quarrel over the kind of text-books, the style of seat, or particular form of architecture they shall adopt, while our fellow-countrymen waste their physical and mental energy to have a pretty home painted and papered in the latest style. But scarcely one of them spends a moment of time or a dollar of money to secure perfect heating and ventilation, which are a thousand times more important to their physical prosperity and length of days.

The question naturally arises, how shall we heat and ventilate our homes, public buildings, and railroad coaches, with practical perfection ? In answer to this question I will say : there are three prime factors that must be carefully considered. They are : 1st. A practically uniform temperature should be obtained through each room or car ; 2d. From one thousand to one thousand five hundred cubic feet of pure air, warmed to about 70° or 75° Fahr., should be supplied each occupant hourly ; 3d. The prompt removal of all foul air from each room or car as fast as it is produced. While securing these prime factors, it is also necessary to observe four other important features in the selection of the apparatus and

system for heating and ventilation. They are : 1st. Safety ; 2d. Economy ; 3d. Durability ; 4th. Simplicity. To accomplish the required results in compliance with the above requisites, an air warmer should be used with sufficient radiating surface to simply warm the required amount of air to the required temperature without the air having to pass at any time over a red-hot surface of iron, or be heated so hot as to materially deprive it of its natural amount of moisture. This may be done by three principal methods : 1st. By passing it over pipes heated with steam ; 2d. By passing it over pipes warmed by hot water ; 3d. By passing it over the heated plates or through the air flues of a furnace or stove. The first and second methods are what is known as indirect heating and ventilation, and when properly constructed and in good order, give fairly satisfactory results. The objections to these methods of heating air are : 1st. It is much more costly to secure the necessary plant, and from one fourth to one third more expensive to run than the direct system of heating ; 2d. In climates where the temperature falls under 12° to 15° below zero, the indirect system is a practical failure, as the condensation in the steam pipes is greater than the expansion, while the water pipes cannot be kept sufficiently warm ; 3d. The danger of explosions, even with low pressure, in the hot-water system, makes these methods more or less objectionable ; 4th. The expense of repairs and the replumbing of a part or the whole of the heating apparatus every few years. The third method is what is known as the warm air or direct method of heating and ventilating, and is not only the least expensive to commence with and by far the most desirable, but decidedly the safest and most efficient method of heating and ventilating yet discovered.

A furnace should be so constructed as to have a large heating surface, without escape of dust or gas from the fire, and at the same time economize the fuel by utilizing all the heat possible, by transmitting it directly to the air to be warmed. In no instance should the air pass over red-hot iron, or only a portion of the air be heated very hot and allowed to cool off by mingling with the cold air of a room ; but the entire quantity of air required for a building or any part of it, should be heated only sufficiently to maintain a temperature of about

70° or 75° Fahr., when it is distributed through a room, and at the same time retain its natural moisture. Whenever a furnace or stove requires an evaporating pan to keep the air moist, it is high time such a stove or furnace should be removed, and a modern furnace or stove become its successor. After the air has been properly warmed, the next important question is, Where shall the fresh warm air enter the room and where shall the foul air be allowed to escape? Time and space will not permit me to enter into the details of this part of the subject, and give you all the reasons for the faith within me. Suffice it to say that the method which gives the best results, everything considered, is the one which brings the warm air in at the floor, at the side of the room least exposed to the external elements, and exhausts the foul air at or near the windows, or, in other words, at the side of the room most exposed to the weather, and afterward returning it in tight conduits under the floor, delivers it to the ventilating shaft. By this method the cold foul air is immediately exhausted through the ventilating shaft, which keeps the air in the rooms pure and of an even temperature. I have repeatedly examined rooms heated and ventilated by this method, and have failed to find more than from 3° to 5° Fahr. between the floor and the ceiling, or the warmest and coolest parts of the room. My own house is heated and ventilated after this method, and is open for inspection by any person who is interested in the assertions I have just made.

The old method of putting a register at the top of the room, for the escape of the foul air, is neither economical nor scientific, as it wastes your heat, cools off your room, and leaves the cold foul air as its legacy. It may be said for people in moderate circumstances, that this is too expensive. In that case, I would recommend them to get improved heating stoves, made to carry out this general plan, and which are provided with an air chamber that is supplied with fresh air from the outside of the room or building, which in turn is warmed and delivered to the room to be heated and ventilated; while the foul cold air can easily be exhausted through a double chimney with an opening at the floor, on the one side, for its escape; all of which can be done for less than would pay the doctor bills for one case of pneumonia.

It has cost thousands and tens of thousands of dollars to practically demonstrate the few condensed facts I have just given you in this paper, besides years of experimenting and repeated investigations to detect and eliminate the defects, and develop and establish the correct principles of heating and ventilation, and put them on a practical basis; and to that ingenious, persevering, energetic, and progressive sanitary engineer, Mr. Isaac D. Smead, of Toledo, Ohio, this country and the world at large owes more than to any other living man, for the practical development of the most economical and scientific method of heating and ventilating our homes and public buildings, which has yet been developed.

But, you very properly ask me, how are you going to improve the heating and ventilation of our railway coaches, which may be called portable houses and must be supplied with portable heating apparatus and be duly provided against currents and countercurrents of air produced by the running of the trains? I will answer you that the same general principle of introducing the warm air at the floor and exhausting the foul air at the same level, will hold good in the railroad coaches just the same as in a private room or a public building. In order to accomplish this the windows and transoms must be kept closed, and the fresh air of each car supplied by an air pump from the engine, which air supply, when necessary, should be warmed by being passed over the radiating surface of steam or hot-water pipes, or some form of safe, portable furnace, before entering the car. By this method a regular supply of fresh warm air could be supplied to each car, regardless of the outside zephyrs or the direction or speed the car was running, while the same gentle but regular air pressure would constantly facilitate the escape of the cold foul air and keep the floor of the car comfortably warm and the air of the coach practically pure, day and night.

That these methods of heating and ventilating our homes, public buildings, and railroad coaches are a practical success, especially in the first two instances, is now beyond a peradventure, and that they will remove the foul air from a room has been proven by repeated chemical analyses; while the hydrometer has shown that the natural moisture of the air is practically retained, and the thermometer has determined the

regularity of the temperature thus obtained, which shows but a trifling variation in any part of a room.

Who can assert that an abundance of pure air of a regular temperature and moisture, is not preventive of pulmonary diseases? That is just what we seek to find in our health resorts for the relief of pulmonary affections—a regular climate which is neither too dry nor too moist, and never too cold or too hot, and which is supplied with oceans of pure air the year round. Are not these the conditions of climate we have just shown you can be produced in every home, public building and railroad coach throughout our land, if properly heated and ventilated? Then can an Italy, a Florida, a California, or even a Colorado, boast of more? But even granting they can furnish an invalid all of these conditions of climate in their perfection, only a limited few of the surging masses of humanity can afford these natural blessings, while the preventives I have just prescribed are within the reach of all, whether rich or poor, high or low, from childhood to old age.

We dare not deny that the production of a regular climate of pure air, such as we have suggested, although the production of art will aid materially in reducing the annual crop of pulmonary affections; neither can we deny that the opposite conditions, which we have shown you now exist, aid very materially in increasing the annual crop of pulmonary diseases, throughout our land.

Our laws throw their protecting arms around the swine in our pig pens and the cattle upon a thousand hills, and say to the contagious diseases that affect them, "Thus far shalt thou go, and here shalt thy destroying arm be stayed." Are not the health and lives of our fellow-citizens—nay, I will put it, your daughter or my son, worth even as much as those of the dumb brutes in the field? And yet, the laws of our land are practically as silent as the Statue of Liberty in New York Bay, on the question of a bountiful supply of God's pure air in our homes, public buildings or railroad coaches.

Our Prohibition friends have organized and maintain a third political party, and spend millions of dollars annually to prevent the suffering and premature death of the inebriate, which only constitutes a fraction of the premature deaths produced by the ravages of pulmonary affections throughout the length

and breadth of our land, each year. I doubt if they have ever turned a hand or spent a dollar to secure a reform in heating and ventilation, and thereby aided in preventing a far worse and much more fatal affection of the human family than even chronic alcoholism, and at the same time one that to a large extent can be prevented by compelling and maintaining, if need be by law, a generous supply of God's pure air to every home, public building, factory, workshop, store, office, and railroad coach throughout our land.

When this is accomplished, and not until then, can we ever expect to see the dawn of a sanitary millennium, in the reduction of the mortality statistics of pulmonary affections to a common level with ordinary diseases.

ANCIENT AND MODERN FELTS.—An illustration of the intimacy of the most modern and most ancient of civilizations is found in the fact that it was left for an American citizen to first successfully essay the mechanical fabrication of felted cloths. Thomas Robinson Williams, of South Kingston, R. I., invented the process of making felted cloths of commercial length, and patented it May 22d, 1830. Since that day felts have appeared in innumerable forms—as printed and embossed piano-cloths, ladies' skirts, floor coverings, often with highly artistic designs, material for roofs and protectors against weather, piano-hammers, shoe-linings, etc. Thus we have taken the simple discovery of antiquity and made it among the chief instrumentalities of civilization. The Tartars and kindred peoples who occupy the middle and northern regions of Asia, and whose manners and customs have remained unchanged from the most remote antiquity, employ the felted wool in a variety of functions, only less important than the supplying of foods. Both their clothing and their habitations have consisted of felt since a knowledge of them first went upon record in the fourth century. The ancients employed felt for a great variety of uses, just as we do.—From “*The Manufacture of Wool*,” by S. N. D. North, in *The Popular Science Monthly* for June.

ON THE HYGIENIC VALUE OF FORESTS.

IN the last International Congress on Agriculture and Forestry, held at Vienna, Professor E. Ebermayer, of Munich, emitted the following opinion on the above-named subject :

I have examined the air and the soil of forests. The results of my investigations show that there is no material difference, chemically demonstrable, between the air in forests and in the open country. In the midst of the huge oxygen-manufacture represented by the forest, man is not offered more oxygen nor less carbonic acid for respiration than in districts without any forest. It is customary to exaggerate the oxygen production of the forest. A forest of medium size absorbs in a five months' period of vegetation about 6000 cubic metres of carbonic acid per hectare, and returns for it a quantity of oxygen approximately of the same amount. These quantities are of vanishing importance in comparison to the quantity of air contained in the forest, and which moreover is not excluded from the forest. An adult person consumes in a year by respiration as much air as a forest of three acres would produce. The amelioration of the air produced by a hectare of forest is offset by a family of four persons. For this reason neither small baskets nor squares, gardens and meadows studded with trees and shrubs inside of large populous cities can claim any importance from the chemical amelioration of the air, while they contribute very much to the sanitary improvement of the soil. Forest air, consequently, has not a favorable action on health on account of its greater oxygen contents ; its value resides in purity, exemption from dust and smoke and the small quantity of injurious vapors and gases contained in it. Forest air, just as sea and mountain air, is poorer in bacteria ; even the air in city gardens shows this difference. Besides this, forest air is not inhabited by bacteria species of the same dangerous nature as city air. The air in the skirts of a forest as well as over the crowns of the trees is richer in ozone. In the interior of the forest ozone is taken up by combining with the decomposing waste-matters

of the forest. Forests are acting also as protections from strong atmospheric motions, especially from the rough air-currents which easily cause inflammatory diseases. For this reason, sanitary stations should be located in the neighborhood of forests, on southern declivities protected from cold winds, high above the bottom of the valley. In itself pure and good air is no medicament, it is only a coadjvant of medication. Air-sanitaria for persons affected with nervous disorders, anæmia and pulmonary diseases prove highly efficient. Yet the most important influence pertains to the forest soil. In it the bacteria of more pretentious habits, to which belong the pathogenic bacteria, fail to find favorable biological conditions. The vegetable organic substances in the forest soil, being poor in nitrogen and in phosphoric acid, present a less acceptable alimentary substratum than the manured fields or gardens; moreover, many forestsoils are acid and the least quantity of free acids kills the bacteria or arrests their development. The moisture of the soil in the well-administered forests of plains and on hills is comparatively small, partly in consequence of the large consumption of water by the trees—a beech, 115 years of age, evaporates 60 litres of water daily—partly on account of the dense roof formed by the crown, which like a screen detains a considerable portion of all precipitations. The draining action of the roots, especially in firs and pines, is very considerable. We have to add the lower temperature of the shaded forest soil, which causes the innocent hyphomycetæ and saprophytic fungi to occupy the forest soil in much larger numbers than the far more pretentious bacteria. In desiccations of the upper layers of the soil, the leaf, moss, or humus, covering eventually the grass, prevent the rising and transportation of the dust; for this reason forest air is less impregnated with dust and with fungi. No pathogenic bacteria have been found in forest soil until now. Where there is pure soil there is pure air. From this fact results the important value of tree plantations of a certain dimension in large cities.—(*Allgemeine Wiener Medicinische Zeitung*) *Pacific Record*.

PHYSICAL HYGIENE AND THE BICYCLE.

By A. D. ROCKWELL, M.D.

THE right use of the muscles is a subject that has for years engaged the attention of hygienists, and one, too, that is perhaps better understood than almost any other branch of hygiene.

The Greeks well understood the importance of muscular training, and in their athletic sports gymnastics was refined to a science. Under the pressing needs of our rapidly rising civilization, attention has been variously and studiously recalled to the subject of physical development as a means of counteracting the excessive and unequal excitements with which nearly all brain work is more or less associated. Baseball and boating clubs, yachting, gymnastics light and heavy—all these methods of muscular exercise are now developed into sciences, and, when rightly studied and practised, may become invaluable means of training the body and preparing it to meet with less peril the toils of modern society. The modern system of training has not been without errors in regard to the relation of the quantity and quality of the food and drink to muscular strength.

Gross blunderings of creed and practice have been held, and the violence to which all these games and sports are pushed has wrought evil that has mingled with the good, and much disheartened the friends of enlightened physical culture. And yet, on the whole, the accepted views and customs of this matter of exercise are at present more nearly correct than in any other branch of hygiene. Extremes have gone down, wild excesses have been discontinued, the hideous and distasteful have given way to the comely and agreeable, and in all directions there has been a tendency to sift, to prune, and to reduce to a finished whole the science of physical training.

Almost every form of physical exercise has its enthusiastic advocates who base their opinion of its superiority over other methods either upon the ground of healthfulness or pleasure.

The young and vigorous, who "know not of their health," give little thought to the *method* of exercise so long as it meets the requirements of pleasure alone, and therefore the billiard-room and the bowling-alley possess attractions to a host of young men who imagine that they are fulfilling the various necessities of physical exercise by punching billiard-balls in a hot and close atmosphere surcharged with tobacco smoke, or bowling in some underground alley-way.

All indoor athletics are, at the best, but a poor sort of makeshift for the attainment and preservation of health. The perfection of bodily and mental activity can be successfully woed and kept only in the free open air and bright sunshine. Even the gymnasium, with its rational and thoroughly systematized methods and its corps of well-trained instructors, falls far short of accomplishing the best possible good for the miserable dyspeptic with his lazy liver, or for that utter exhaustion of the nervous system which is such a frequent result of a busy life in our restless, rushing civilization.

Physical exercise, to be beneficial, must in no way be perfunctory. The daily walk to and from one's business is a relief and a benefit, no doubt, but how stale and unprofitable it becomes after a time! There are four things which few men learn early, and the majority never, and these are : How and what to eat and drink, and how and when to exercise the body.

Every sensible and observing physician, the longer he lives, must become more and more convinced that the cause and cure of the majority of the ailments that afflict humanity depend very much upon food and drink and habits of exercise. No saying is more trite than that men and women take too much medicine. They take many times too much, and too often the diseases and symptoms of disease for which relief is sought by this indiscriminate dosing are stimulated into increased activity.

The writer would by no means convey the impression that drugs are valueless, nor that there is not the widest range for their judicious administration. He simply protests against the impertinence of constantly interfering with the prerogatives of Nature. What sort of a teacher would he be considered who was always solving his pupils' mathematical problems or

translating his Latin exercises? A vigorous intellectual growth is not stimulated in this way, no more than physiological functions are excited to a healthful activity by the artificial aid of pernicious poisons indiscriminately and persistently repeated. Our body is simply an incessantly active furnace, and the crucible through which its fuel must pass to be consumed is the liver. If the consumption is imperfect and incomplete, very much the same thing takes place in this human furnace as in the furnace that heats our house. If the draught in the latter is insufficient, the combustion is imperfect, and the coal, instead of being reduced to fine ashes, remains in the form of half-burned cinders, and materially interferes with the efficiency of the whole heating apparatus. In the human body the evil results of an imperfect combustion are far more widespread and complex than this.

Besides the obstruction to the portal or liver circulation, the imperfectly transformed products of digestion, circulating through every portion of the system, poison both brain and body. This it is that causes much of the irritability and unreasonable outbursts of temper among men.

Now, what the coal, and the draught which acts as the efficient factor in consuming it, are to the furnace, such are food and adequate muscular exercise to the body. What a simple statement and yet how true, and how few give it more than a passing thought! It is a fact so important that, misunderstood or its suggestions neglected, more misery, mental and physical, are entailed and more lives destroyed than can be told. That old and vigorous exemplar of the benefits of simple living, Hannibal Hamlin, spoke truly when at a recent banquet in this city he said that "gluttony killed more men than intemperance," for where one is intemperate a hundred overeat.

If men would be strictly temperate in eating and drinking, taking the simplest food and no more than is absolutely necessary to repair the ordinary waste of the body, the healthful activity of its various functions could be maintained with the minimum of muscular exercise. This Spartan simplicity of diet, however, is seldom attempted.

The appetite is a capricious master, and the difficulty is that the table offers temptations to eat and drink a far greater

amount than this human furnace of ours can take care of without a very active draught in the shape of bodily exercise. The title of this article is Physical Hygiene and the Bicycle, but, like Artemus Ward, in his lecture on Sixty Minutes in Africa, in which he said nothing about Africa, I have said nothing about the bicycle. And yet he who reads and has appreciated, as the writer has, the pleasure and lasting benefit that come through this form of exercise, will easily see *bicycle* written between all the lines. Upon that subject, indeed, I claim the right to speak with authority, since for years I had felt the necessity of counteracting in some way just such a condition of affairs as I have briefly attempted to portray. The gymnasium, horseback riding, pedestrianism—all these have at various times been attempted with more or less enthusiasm and persistency, and not without avail, but never until I purchased a bicycle and learned its use did I get the best return in health and pleasure. It is not less exhilarating nor more exhausting than horseback riding, and, contrary to the frequently expressed opinion of those who had no practical experience in this direction, it brings into active play a greater number of muscles than almost any other form of rational athletic sport.

If anything was wanting to render more complete my enthusiasm over the delights and benefits to be derived from the bicycle, it was supplied in abundant measure last summer by a ride of two hundred miles or more through the Berkshires. Having mapped out our route by the aid of one of the numerous road and guide books which give very accurate information as to the character of every road, a party of five of us started with our Columbias by train for Great Barrington. Reaching that place at noon, we wheeled to Lenox, where we passed the night.

The next day found us on our way through Pittsfield to North Adams, where an excellent dinner and a night's rest prepared us for the third day of our outing. On a road as smooth as concrete and following the trend of the mountain range, from which the summit of old Greylock towers high above its fellows, we passed through the charming village of Williamstown, and thence through one of the most beautiful and picturesque of valleys to the old town of Lebanon, with

its springs and Shaker settlement. The fourth day of our ride was along the banks of a rapid stream through the Kinderhook valley to the town of Kinderhook, thence to the city of Hudson on the Hudson.

Having thus in four days easily completed two sides of the triangle of our journey, we began on the morning of the fifth day our ride over the third side, or base, *en route* for Great Barrington. Dining at a comfortable farm-house twelve miles from Hudson, we spent the night, some ten miles farther on, at the pretty little town of Hillsdale. A few miles out of Hillsdale we encountered the next day the first real work of our journey. Here we were confronted by a barrier of hills, over which no bicyclist, however skilful or strong, could hope to ride. For three miles we pushed our wheels before us until, finally reaching the summit, we found that we were to be many times repaid for the work so readily accomplished.

Not only was the view surpassingly beautiful, but, stretching out for miles before us to the valley below, we found the road as hard and as smooth as concrete.

A ride such as we then enjoyed is not to be had every day. Placing our feet upon the foot-rests and occasionally using the brake to check somewhat the rapidity of our flight, away we went like the wind for mile after mile. I have ridden behind race-horses, on locomotives, and on horses fleet and strong, but never before had I experienced such perfectly joyous and exhilarating emotions as in that swift ride down the eastern slope of the Berkshires. It was the very poetry of motion, and we wheeled to the steps of the hotel, whence we started just six days before, with keener appetites, more vigorous digestion, and in that condition of complete health only found when the collective bodily activities seem one, each organ performing its function unconsciously, unheeded.—*New York Medical Journal*, May 23d, 1891.

A RETROSPECT OF THE SUCCESSIVE EPIDEMICS OF CHOLERA IN EUROPE AND AMERICA FROM 1830 TO 1890.

DR. WILLOUGHBY, in a paper before the Epidem. Society, after alluding to the doctrine of epidemic influences, telluric and atmospheric conditions, and other unknown agencies as at once baseless and needless, and to the opposite delusion, prevalent in the South of Europe, of its being infectious in the same sense as small-pox, asserted that all the independent and scientific students of the subject in Europe and America were now agreed that the vehicle of contagion was contained in the evacuations ; that it was thus carried by fomites, as soiled clothing, etc., while persons suffering from the disease, even in unrecognized and mild forms, infected the soil and water of places through which they passed. Insanitary conditions favored its development, but the most insanitary towns—as Rome, Seville, and others—had escaped, since they had been provided with pure water supplies. The incubation period he believed to be as a rule from one to two days, four being an ample limit for quarantine purposes. Its transportability and conveyance wholly and solely by human intercourse was proved not only by the progress of every epidemic having followed the great routes of trade and pilgrimages, but by the rapidity of this progress having corresponded to the facilities for travel, whether by caravans, river boats, railways, or ocean steamers, quoting in this connection Dr. de Renzy and others as to the altered circumstances of travel in Northern India ; and he thus explained the immunity of Australia and Chili, virtually the most isolated communities in the civilized world. It was, he said, in 1821 that cholera, so far as was known, first advanced from India westward, reaching Astrakhan in 1823, but subsiding until 1827, when a fresh wave swept over Persia, entering Russia in 1829. In 1830-31 it was fomented by the war in Poland ; in 1831-32 it spread over the whole of Europe ; and in 1832-33 over North America, lingering in each continent for about two years

longer. It was remarkable, and totally inconsistent with the theory of conveyance by winds, that, though some cases had occurred on board ships in the Medway as early as July, 1831, it did not reach London till February, 1832, having effected a landing at Sunderland and travelled *via* Newcastle, Edinburgh, Glasgow, Belfast, Dublin, and Cork, whence it was at length brought to London. A wave rolled over Persia, Arabia, and Syria between 1836 and 1839, but retired again. In 1840 it entered China, then passed westward through Central Asia, re-entering India from Afghanistan and through North Persia, reaching the Caspian and Black Seas in the summer of 1847. Following the military road then in course of construction from the Caucasus to Moscow and the river highway of the Volga, it was intensified and spread by the fair at Nijni Novgorod and the massing of the Russian, Austrian and insurgent Hungarian armies on the Danube, and in the course of 1848-49 had attacked every country in Europe except Denmark and Greece, which were saved by stringent quarantine. It extended to America in 1849, but died out in the course of the following year. The epidemic of 1854 was not strictly a separate invasion, but rather a resuscitation of the last, which had lingered in the south and east of Europe and the west of Asia until called into fresh activity by the Crimean War. Every country in Europe and America was again invaded. The incidents of the outbreaks in America threw great light on the conveyance of the disease by fomites. The epidemic of 1865-66, which was the first to come wholly by the Red Sea, spread rapidly over Europe and America; but had scarcely subsided when a fresh explosion occurred at the Hurdwar fair in India in 1867, whence it was carried to Persia and Russia, being reintensified *en route* by the pilgrimage at Great Mesched in 1868 and the fairs at Nijni Novgorod in 1869 and 1870.

At the close of the Franco-German War, every country in Europe was attacked except Great Britain, and America succeeded in averting its importation until 1873. By 1874 it had, however, disappeared everywhere on this side of India. In 1881-83 it prevailed in Arabia and Egypt; in 1884 it made its appearance in France, and soon raged throughout Italy and Spain. The influence of pure water supplies was brought

into special prominence, not only in the case of single towns in Italy and Spain, but in the almost complete immunity enjoyed by Germany, which had previously suffered heavily in every epidemic. Cholera lingered in the south until the end of 1885, since which date it had been absent from the Continent of Europe until the isolated outbreak in Spain in 1890. This, Dr. Willoughby was convinced, was not imported from the East, but was a recrudescence of the epidemic of 1884-85, brought about by excavations in infected ground. Still cholera had, since 1888, been slowly but steadily advancing by the Persian Gulf and the extensions of that route. It had last year reached the shores of the Caspian and Black Seas, and had raged at Mecca, though Egypt had almost miraculously escaped, and it had persisted at Aleppo and the Syrian ports certainly as late as January of the present year. He had little doubt that, as its march had closely corresponded with that in 1845-47 we might expect history to repeat itself in an invasion of Southern and Eastern Europe during the coming summer, unless, as in 1823 and 1839, it should retire, after having thus approached the confines of Europe. If, however, it had not already really died out, the vast increase of communication between the two continents rendered such recession less probable than it was fifty years ago. The paper was illustrated by a number of maps showing the great routes and the course of each epidemic in Asia, Europe, and America. Sir W. Moore gave his experience of an outbreak at Aden following the unloading of a cargo which was proved to have been soiled with cholera excreta at Bombay, the crew remaining healthy ; and Mr. Murphy alluded to Dr. Simpson's having traced the occurrence of cholera on board certain ships moored in the Hooghly to an infected milk supply. Surgeon Dawson argued in favor of epidemic influences, but Dr. Willoughby, in reply, urged that in the case of the ships at sea quoted by Mr. Lawson, the crews, who must have been most exposed to atmospheric influences, escaped, the steerage passengers only being attacked ; while such negative evidence as that of the Southampton and Theydon Bois outbreaks in 1865 was worth nothing. It was more probable that some one suffering from mild and unrecognized cholera had crossed over from France, and, leaving the infection behind, had perhaps returned, than

that Mr. Groombridge had inhaled it with the sea breezes on Weymouth pier. Such difficulties were incident to all cases even of small-pox, the source of which no one doubted. The President complimented Dr. Willoughby on having brought within the compass of a single paper a mass of information hitherto inaccessible, and on having by his demonstration of the almost "postal regularity" with which the late epidemic followed the routes of travel by road, rail and steamships, regardless of prevailing winds, but refusing to cross the Scandinavian and Carpathian mountain ranges in mid-winter, given the *coup de grace* to the doctrine of atmospheric waves, which, in the case of this disease, he had until that evening accepted.

—*Lancet.*

THE PRESENT STATUS OF THE KOCH TREATMENT OF TUBERCULOSIS.

THE absence of exact science in the medical knowledge of the day has perhaps been nowhere so well exemplified as in the extreme readiness of both profession and laity to accept the unproved word of a single man in relation to a hitherto unanswered and weighty question in therapeusis—that of the existence of a specific control of the tubercular process. Nor is the precipitate haste on the part of the clinicians to condemn the method, as yet not even half tried, any more evidence of the development of stable principles in our methods of combatting disease processes. From a theoretical standpoint, excluding from present consideration the general care and management of the patient, the destruction, or modification of the matcries morbi is to be accomplished in four probable ways; these include: the utilization of the antagonism of micro-organisms toward each other; the deleterious effect of micro-organismal products on the growth of micro-organisms; the unfavorable effects on micro-organisms of certain agents of mineral or organic origin; and the production of general surroundings unfavorable to the advance of the infection, both in the individual and in the community. To the second of these groups is to be referred the method recently proposed by Professor Koch for combatting the tuber-

cular process. This method, which is substantially if not precisely identical with the measures previously employed and announced by Dixon of this city, has for its underlying principle a fact, the verity of which may easily be recognized by analogy in numerous instances of the incompatibility of waste products with productive growths. Thus alcohol, as a product of vegetable activity manifested as fermentation, when present in proportions beyond 20 per cent is sufficient to retard and eventually destroy the actions and vitality of the ferment. Nor is the use of the products of bacteria as a means of altering the further growth of bacteria in the animal tissues by any means a recent one, as may be noted in relation to the work done upon the bacillus pyocyaneus by Charrin and others. Separation of the fluid product of the growth of this last bacterium from the culture itself, by means of an unglazed porcelain filter, and inoculation with this sterile product has prevented the inception of pyocyanic disease in animals after subsequent inoculations with virulent matter. Probably the same principle underlies the Pasteur method of hydrophobic prevention ; and the field of preventive medicine glows with promise of great and near discoveries in this same line in other diseases.

The substance used by Koch in his experiments and more recently in the treatment of tuberculosis in man, and which, as already stated, is produced in practically the same manner by Dixon, is obtained from cultures of tubercle bacilli exposed to altered conditions of life by means of extraction with some such menstruum as glycerine. This material, from which no definite active agent has been eliminated by Koch, when brought into contact with tubercular growth in the animal economy, is announced to produce decided lowering of activity of growth and eventually, if in sufficient proportion, to permanently stop the morbid process. In the animal economy, further, as an evidence of its action, whether by direct action upon the germ, or by inducing deleterious changes in the tubercular tissues, there is manifested a febrile reaction ; and as a result of its action it is stated that there is a destruction of the diseased structures and subsequently their replacement by cicatricial tissue. The exact mode of operation is not known, various theories having been offered in explanation.

Such was the knowledge established by the researches of Dixon and Koch, and eagerly seized upon by the entire world in the expectation of mastering tuberculosis. In the natural course of the rapid popularization of so important a discovery, the limits of its application have been wittingly as well as ignorantly widely overstepped; badly diagnosed cases and cases whose only cure can be death have been subjected to the vicissitudes of the treatment. With an eye singly to the result of the means upon the tuberculosis, cases have been permitted to approach the fatal termination because of the neglect of the true end, the recovery of the patient; and too often even the increased nutritive need of the weakened system has been passed by in the endeavor to overcome the process at fault. Clearly, in the method of action of the substance it was to be recognized that its only safe application could be found in the most localized forms, and preferably in foci where elimination of the products could be performed most thoroughly and with least severity to the organism; nevertheless, in the mad hurry, cases of advanced degrees of the disease and cases marked by generalization of the malady have been permitted the treatment, only to swell the death list which has been heaping discredit upon the measure. Where tubercular foci are numerous and widely distributed, if each focus is to be the scene of rapid necrotic processes, each followed by a local focus of reactive inflammation, what is to be expected but the effects of an intense toxæmia and fever, which are the necessary attendants of such a condition?

Where the lungs are riddled with the tubercular changes of late chronic phthisis, what is to be expected if this new therapeutic agent accomplish the best possible results, and yet leave a great mass of cicatricial tissue to block up and hamper the pulmonary tissue? Moreover, what of that great mass of patients, from whom, the treatment having failed to produce notable external changes, the lymph was withdrawn and death followed—are the repositive evidences of no palpable changes in the internal tubercular localities in the line of change indicated? How is it possible from post-mortem appearances to affirm absolutely the generalization of the tubercular process in this or that position, within a definite and brief period? These are the considerations upon which more information

and more definite knowledge should be demanded from those who condemn the method. Its action upon true cases of lupus has been too decisive to permit, in other localized forms of tuberculosis, any discredit until more exact information is had. The conflict of reports is too great at the present date and the tendency of medical opinion too observant of so-called policy to allow an absolute decision ; this will and can only come when the lymph method has fallen entirely out of injudicious hands and is left to the investigation of the cautious and thoroughly interested.

There are other phases of the subject, too, which cannot fail to attract attention in the future. How much of the severity of the reactions, and how much the failure in results may be due to the presence of substances other than the essential toxalbumen in the lymph ? What auxiliary measures are those best adapted to the furtherance of the favorable results of treatment ? Finally, if even in mild cases of pulmonary tuberculosis failure should be established, there is one other point of the utmost importance to be further examined. In the earliest paper of Dixon (*Medical News*, November, 1889), antedating Koch's announcement by more than a year, there were distinct expressions of the development of immunity in animal tissues against the tubercular process by this general method ; and investigations carried on in rabbits and guinea pigs have with considerable uniformity confirmed this hypothesis. It is undoubtedly an injudicious act to inoculate healthy individuals with an agent of which so little is known as this mixture of the retrograde products of tubercle bacilli, but it has been and doubtless will be done more or less frequently for a time. There are no positive arguments in relation to tuberculosis refuting the usual rule of infections to protect against themselves ; and there do occur occasional cases whose clinical histories present features not averse to this view. For example, within the knowledge of the writer, a young man of questionable family history, who for twenty years had had a destructive scrofuloderma only cured within the past few years, became accidentally inoculated with tuberculosis, while performing an autopsy upon a tubercular body. To ordinary observation, the usual course of inoculated tuberculosis was manifested, the healing of the original wound the

period of some days' quiescence, the formation of a nodule at the site of sore, and the breaking down of the surface into a slightly purulent fluid to the formation of a tubercular ulcer. Within more than a month no lymphatic involvement had become manifest, and the local node was removed by operation. Thus far, nearly five months, there is no evidence of general infection. Such cases have occurred before and the process remained for a long time localized—yet may not the previous tubercular condition as manifested by the existence of scrofula, have exerted some limiting influence upon the inoculated process? The existence in otherwise normal lungs of isolated and calcified nodes of old tubercular processes may suggest the protective value of the results of the prior disease; and where these are associated with evidences of general advancement of the process there enters the question of whether there had not been at least a temporary protection analogous to that afforded by vaccination.

This, then, is the status of the proposition. The statements denying value to the treatment of tuberculosis by the method of Koch, whose claim to consideration rests upon what appear to be general laws, and is corroborated by laboratory researches, lose their own force from the numerous faults of omission and commission met in the widespread and ignorant application of the method. Even should it fail as a curative, except in the localized and superficial variety known as lupus, there is yet another field for its usefulness open to investigation, its possible preventive power.—*Medical and Surgical Reporter, May 9th, 1891.*

IMMUNITY AGAINST INFLUENZA FURNISHED BY VACCINATION.—Dr. Goldschmidt, of the island of Madeira, investigated last year the effect of vaccination upon the liability to influenza. He found that no one of one hundred and twelve individuals upon whom revaccination had been successfully performed suffered from influenza, and of ninety-eight persons in whom the revaccination did not take, only fifteen had symptoms of the disease. He also quotes other cases, and attributes the immunity generally enjoyed by young children in epidemics of influenza to the influence of the first vaccination.—*Medical Record.*

MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

THE PYOGENIC PROPERTIES OF THE LIQUID FOUND IN HYDATIC CYSTS have been carefully studied by M. Chauffard. The *Gazette Hebdomadaire* finds the communication sufficiently interesting to warrant its publication entire.

"It is well known," he says, "that the intraperitoneal rupture of non-suppurating hydatic sacks may give rise to secondary phenomena of a toxic but never of an infectious character. The experiments which I have made, in connection with Widal, in three cases of hydatic cysts of the liver, prove that the clear liquid of these cysts, like springs from rocky ground, is strictly aseptic.

"To determine whether this aseptic liquid constituted of itself a favorable medium for the culture of different kinds of pyogenic microbes, we used for comparison tubes containing peptonized bouillon and tubes containing the hydatic liquid.

"The latter gave us some fine specimens of culture, as staphylococcus, streptococcus, the ordinary bacterium coli, etc., but the production occurred a little later than in the peptonized bouillon.

"We determined the fact afterward that the hydatic membranes, even of the thin vesicles, constituted a perfect natural filter through which the microbes could not pass. We found, on the other hand, that the hydatic membrane was easily penetrated by soluble substances, the metallic salts, such as sulphate of copper, the iodide of potassium, the sublimate, etc. We then endeavored to determine the quantity of the antiseptics, as sublimate, phenic acid, naphthal *Beta* and the like, necessary to keep in a sterilized state the hydatic liquid into which the aureus or common bacterium coli had been introduced. To prevent all pyogenic germination in a hydatic cyst containing two litres of the liquid, it would, according to our experiment, require about 36 grammes of the liquor of Van Swieten.

" Of the phenic, the dose necessary would be too great to be used with safety in practice.

" With naphthal *Beta*, the hydatic fluid, to which one sixth of water saturated with naphthal had been added, would not resist the formation of germs.

" The clear hydatic liquid does not seem, therefore, to be to any extent a bactericide ; it may even be considered an excellent culture element for microbes. Besides, all the pyogenic microbes may be found in hydatic cysts that have gone on to suppuration, but this suppuration cannot take place unless the walls of the inclosing cyst have been fissured or so altered by proximity to or contact with an adjoining suppurating cyst, whatever may have been the source of infection. It is also of no importance whether infection reaches the adjoining cyst walls through means of the blood, or, what is more probable, through the bile. There are no germs of microbes in a hydatic cyst that is without lesion. It may happen that we do not find a pyogenic germ even in a suppurating cyst, a fact which explains the slight virulence of hydatic pus, at least in certain cases."

Another fact of a somewhat similar nature has been added to the one above by the same journal.

MM. Charrin and Roger have found in a hemorrhagic plural effusion the bacillus of Eberth ; this bacillus is found in all abscesses that occur in typhoid cases, and it is found also in all the cases of effusion that occur in the course of typhoid-fever.

MICROCIDINE, a new antiseptic, was the subject of a report of the experiments of Dr. Berlioz, of Grenoble, presented to the Academy of Medicine by M. Polaillon, which is taken from *Le Progrès Medical* of May 2d :

" The new agent consists of 75 per cent of naphtolate of soda and 25 per cent of the compounds of naphthal and phenol. It is a powder, soluble in water in the proportion of one part to three. The concentrated solution is brown ; a 3 per cent solution is colorless. The solutions are strongly antiseptic and but slightly toxic. They are not caustic, do not discolor instruments nor dressings, and are not expensive. The antiseptic properties of the microcidine are inferior to that of the

bichloride of mercury, but ten times stronger than that of phenic acid, and twenty times stronger than boric acid. It is eliminated by the kidneys. It is besides an antipyretic. In experiments with a 3 per cent solution M. Polaillon obtained the rapid cicatrization of ulcers of the leg, of suppurating wounds, and even of gangrenous ulcers. In recent wounds microcidine prevents the formation of pus, like other phenic or naphthalic antiseptics. Microidine may, in fine, be classed among the best antiseptics and the least dangerous."

CYST OF THE NASAL FOSSA.—The *Siglo Medico* reproduces from *La Gazeta Medica de Valencia* an interesting case reported by Professor Bartual :

" A young lady eighteen years of age had a swelling, located on the floor of the anterior part of the left nasal fossa, which extended beyond the border of the apophysis of the palatine and pushed forward the ala of the nose on the same side, and pressed the upper lip forward and upward.

" A simple inspection of the case, by distending the ala of the nose, brought the tumor full into view. It did not differ in appearance from the rest of the mucous surface ; it was smooth and almost shining. To the touch fluctuation was perceptible, though not very distinct.

" The mother assured me that the swelling existed from childhood, although it was not very noticeable until within a few months, since which time it had increased very rapidly, although without causing any apparent inconvenience.

" I decided that the proper treatment was to puncture the cyst with a narrow-bladed bistoury. From the opening a quantity of thin dark fluid escaped.

" A farther examination after the evacuation of the cyst convinced me that it had existed for some years ; it had destroyed the whole of the anterior edge of the epyphysis of the palatine bone to such an extent that the flesh on the upper surface was continuous with that covering the external portion of the maxillary on its anterior part. If pressure were made with the finger on the part that was originally the border, a marked depression was distinctly felt.

" It now remained to determine the best mode of treatment. The first thing was to cure the lesion left after the

removal of the cyst. This became more important because when she was a child the cyst had been punctured, but filled again. It was necessary also to prevent a cicatrix or trace of the operation that might remain to disfigure the face. The depression mentioned filled in a couple of weeks. With a forceps I held the free border of the cyst and resected the foreign growth as far back as I could reach. The part which seemed unlikely to heal I cauterized freely with fused nitrate of silver, and recommended the patient to use an antiseptic solution daily. After a few days it was necessary to again apply the caustic in order to induce a slight phlogistic action and secure complete adhesion of the walls. The upper lip became less swollen, the remaining parts resumed their normal relations, and all traces of the disease were gradually removed."

GARDNER'S SYRUP OF HYDRIODIC ACID is highly extolled by several practitioners as a remedy in the treatment of chronic bronchitis, asthma, acute inflammatory rheumatism, and kindred diseases. In an article contributed to the *Medical Record* some time ago, by Dr. T. J. Yount, of Lafayette, Ind., he says he has used it on himself and many patients with chronic bronchitis, who have experienced almost immediate benefit by the arrest of the profuse secretions and cough. Dr. James Craig, of Jersey City, reports a number of cases of acute inflammatory rheumatism successfully treated with it; and Dr. Oliver, of Boston, equal success with its use in asthma. It is a non-irritant preparation, containing, it is claimed, ninety-nine per cent of iodine. The only objection to it is the strong and pronounced metallic taste which invariably follows its prolonged administration, impairing the appetite to some extent. To prevent this it should be given in teaspoonful doses three times a day at the commencement, and gradually increased to two or three teaspoonfuls three times a day, well diluted in Burgundy wine, porter, or water.

LISTERINE is highly spoken of in fermentative disorders of the alimentary canal. In the summer diarrhoea of children particularly, Dr. I. N. Love, of St. Louis, speaks very highly of it, given in combination with glycerine and simple syrup.

A formula that he has frequently used and recommends is as follows :

- R. Bismuth Sub. Nit.....half a drachm.
Tr. Opii.....twenty drops.
Syr. Ipecac.....
Syr. Rhei Arom.....aa two drachms.
Listerine.....half an ounce.
Mist. Creta.....one ounce.

M. Sig.—Teaspoonful as often as necessary, but not more frequently than every three or four hours. This for children about ten or twelve months old.

BROMIDIA.—Professor Joseph P. Ross, of the Rush Medical College, Chicago, Ill., says that for the past three years he has prescribed bromidia very frequently, and has never yet been disappointed in securing the results required. In cases when there is insomnia without pain, in the delirious stages of acute fevers, in delirium tremens, puerperal mania—in short, in all those cases requiring soporifics, he finds bromidia invaluable. He considers it an excellent combination.

ALCOHOL AND DIGESTION.—From experiments made on himself by Dr. Eichenberg, some further knowledge of the effect of alcohol on digestion is obtained, which contrasts strongly with the teetotal lecturer's experiment, showing how digestion in a glass vessel is retarded by alcohol. Dr. Eichenberg found that a small dose of strong alcohol—*e.g.*, brandy—shortens the time that food in general, whether animal or vegetable, or a mixture, remains in the stomach by more than half an hour. A similar but not quite so marked an effect is produced by a dose of diluted hydrochloric acid or mustard. Pepper and condurango diminish the time the food remains in the stomach by about a quarter of an hour. Beer and an infusion of rhubarb had no effect.—*The Pacific Record of Medicine and Surgery*, March 15th, 1891.

EDITOR'S TABLE.

✉ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, Dr. A. N. BELL, 113A Second Place, Brooklyn, N. Y.

"THE TRUTH ABOUT VACCINATION."—DR. GUNN'S copy received too late for this number.

THE AMERICAN MEDICAL ASSOCIATION.

THE forty-second annual meeting at Washington, May 5th-8th, was in several respects one of the most successful and agreeable the Association has ever held. The arrangements were well made by an efficient committee, of which Dr. D. C. Patterson was chairman. Albaugh's Opera House, where the general sessions were held, was convenient, and the places of meeting of the several sections conveniently accessible. The attendance was good throughout. There were about six hundred registered, and the attendance at the general sessions about one thousand; but there were comparatively few from distant States—the South and West; and also the New England States were meagrely represented.

The Association was particularly fortunate in the accomplishments of the presiding officer, Dr. WILLIAM T. BRIGGS, of Nashville, Tenn., who, by the quickness of his appreciation of the purpose of mere would-be talkers, exercised the happy faculty of anticipating what they were about to say and overruling them with the subject at issue.

The numerous speeches prepared by the correspondents of the *Journal of the Association*, during several months previous to the meeting, in order to show that Chicago is the only place in the United States where it could be successfully conducted, were fortunately committed to the waste basket by the anticipatory action of the Board of Trustees, who readily yielded to the show of numbers in favor of making Chicago the home of the *Journal* without a contest.

The proposed amendment to the By-laws, by Dr. X. C. Scott, of Ohio, to abolish the Committee on State Medicine, was amended—instead of abolish—to transfer the nomination

of that committee hereafter to the Section on State Medicine, instead of, as heretofore, by the Nominating Committee of the Association, and adopted. This action was ruled by the Judicial Council to be inoperative until next year, notwithstanding the motion had been before the Association since the meeting of the preceding annual meeting, and, according to precedent, should have gone into effect at this meeting. The consequence is, a committee of drones, for the most part, called the "Committee on State Medicine," has been appointed for another year.

As at first appointed and for several years subsequently, the Committee on State Medicine was chosen with special reference to its purpose, and the members thereof reported the status of State Medicine in the respective States they were chosen to represent, or contributed to some subject chosen by the chairman of the Section of general interest. But latterly the Committee has been made up, with few exceptions, by mere honorary designation of members who have done nothing.

It is the anticipation of those who have identified themselves with the work of the Section that the members of the Committee will be chosen hereafter with reference to practical work.

On motion of Dr. C. G. Comegys, Ohio, it was

"*Resolved*, That a committee of three be appointed by the President to consider the question of petitioning the next Congress to create a Cabinet officer to be known as the Secretary of Public Health."

Committee—Drs. Comegys, N. S. Davis, and T. G. Richardson.

The report of this committee and the action thereon is given in full on other pages.

There was no other business in the general sessions of particular interest to sanitarians. The Address on State Medicine, by W. L. Schenck, M.D., Topeka, Kan., was read by title only, Dr. Schenck being absent.

The Section on State Medicine was fully occupied, attended by about forty members. In the absence of the chairman, Dr. J. D. Plunkett, of Tennessee (on account of illness in his family), Dr. J. Berrien Lindsley presided.

Reports presented and papers read were as follows :

Report of the Committee on School Hygiene, D. T. Lincoln, Boston, Mass., chairman.

Original Investigations on the Heating and Ventilation of School Buildings, by R. Harvey Reed, of Ohio, offered as a portion of the Report of the above-named committee, of which the following is a synopsis :

1. Date and time of day of inspection.
2. Name of building and room.
3. Number of cubic feet of air in room.
4. Number of pupils present.
5. Outside temperature.
6. Temperature of room, at level of feet, head and ceiling.
7. Humidity outside.
8. Humidity in room, at level of feet, head and ceiling.
9. Kind of heating apparatus in use.
10. System of ventilation employed.
11. Number of cubic feet of fresh air supplied and of foul air discharged per hour.
12. Estimation of amount of carbon-monoxide present in the air of the room.
13. Estimation of amount of carbon-dioxide.
14. Consideration of amount of organic matter present in the air of the room.
15. Bacteriological examination of the air.
16. Miscellaneous remarks and suggestions.
17. Conclusions.

Sanitary Inspection in Schools, by George H. Rohé, Health Commissioner of Baltimore.

Sickness and Mortality in the Army of the United States, by Joseph R. Smith, Colonel and Surgeon, U. S. A., Medical Director, Department of Arizona.

The Beneficence of Disease, by A. N. Bell, Brooklyn, N. Y.

The Sanitary and Unsanitary Relations of Underground Waters, by Benjamin Lee, Philadelphia, Pa.

The Duty of the Government in the Prevention of Tuberculosis, by Lawrence F. Flick, Philadelphia, Pa.

The Disinfection of Excreta, by George M. Sternberg, Lieutenant-Colonel and Surgeon, U. S. A.

Simple Methods of Sewage Disposal, by C. W. Chancellor,

Secretary of the State Board of Health of Maryland, Baltimore, Md.

The Coroner System in the United States, by Henry O. Marcy, Boston, Mass.

Hygiene in the Rural Districts, by G. W. Jenkins, Kilbourn City, Wis.

Most of the papers above named will appear in these pages hereafter, after they have appeared in the *Journal*.

Officers of the Section elected for the ensuing year :

Chairman, Benjamin Lee, M.D., Philadelphia, Pa.

Secretary, Lawrence F. Flick, M.D., Philadelphia, Pa.

Officers of the Association elected for the ensuing year :

President, Dr. H. O. Marcy, Boston, Mass. ; First Vice-President, Dr. Willis P. King, of Missouri ; Second Vice-President, Dr. Henry Palmer, of Wisconsin ; Third Vice-President, Dr. W. E. B. Davis, of Alabama ; Fourth Vice-President, Dr. W. E. Taylor, of California ; Treasurer, Dr. Richard J. Dunglison, of Pennsylvania ; Secretary, Dr. W. B. Atkinson, of Pennsylvania ; Librarian, Dr. George W. Webster, of Illinois ; Trustees, Dr. W. W. Dawson, of Ohio, Dr. W. W. Potter, of New York, Dr. J. H. Rauch, of Illinois.

Judicial Council—Dr. H. O. Walker, of Michigan, to fill vacancy ; Dr. W. T. Bishop, of Pennsylvania ; Dr. G. L. Porter, of Connecticut ; Dr. James F. Hibbard, of Indiana ; Dr. C. H. Hughes, of Missouri ; Dr. Hunter McGuire, of Virginia ; Dr. A. M. Owen, of Indiana ; Dr. H. D. Didama, of New York.

Place of meeting, 1892—Detroit, Mich. ; time of meeting, first Tuesday in June.

Chairman of Committee of Arrangements, Dr. H. O. Walker, Detroit, Mich. ; Address on General Medicine, Dr. J. S. Cain, of Tennessee ; Address on General Surgery, Dr. John B. Hamilton, of Washington, D. C. ; Address on State Medicine, Dr. C. A. Lindsley, of Connecticut.

ENTERTAINMENTS.

THE RECEPTION AT THE ARLINGTON, tendered by the resident physicians of Washington on Tuesday evening, was a particularly brilliant success. The spacious intercommuni-

cating parlors and ball-room of this admirably appointed hotel were thronged. Delegates, many of them accompanied by their wives and daughters, were made mutually acquainted by the courteous exertions of the local committee, headed by Dr. Lincoln, enlivened by the music of the Marine Band.

Dr. HAMMOND'S reception at "Belcourt," on Wednesday evening, was fully up to the high expectations of it—an elegant affair, thronged with ladies in evening costume, amid the most ornate appointments, exquisite music, and the personality of a host who pervaded the assembly and made every guest realize a hearty welcome.

THE CORCORAN ART GALLERY was thrown open to the Association the same evening as Dr. Hammond's reception, but evidently most of those who availed themselves of it also attended to Hammond's.

On Thursday a party of about two hundred and fifty made an excursion to Mount Vernon.

Thursday evening Mr. THOMAS E. WAGGAMAN received the members of the Association at his private art gallery, O Street.

Surgeon-General Charles Sunderland, assisted by Surgeons John S. Billings, Charles Smart, and others, U. S. Army, received the delegates at the Army Medical Museum; the National Museum was also thrown open to the delegates on the same evening.

The hotels, in the absence of the politicians and office-seekers, who usually crowd them during the period when Congress is in session, were at their best, but the guests of some of the old ones complained, not without reason, of stagnant quarters. Far different, however, was it with other delegates, who were so fortunate as to secure quarters at the new house—

THE HOTEL ARNO, unquestionably the most delightfully situated and the most complete and elegantly appointed hotel in Washington. It is located in the very heart of the fashionable quarter of the West End, on one of the widest avenues, directly in front of the Executive Mansion, between two handsome parks, and convenient to all places of interest. The service is in admirable keeping with the delightful surroundings and internal appointments—the acme of excellence.

THE AMERICAN MEDICAL EDITORS' ASSOCIATION convened at the Arlington Hotel, Washington, on Monday evening,

May 4th. There was a good attendance and half a dozen new members elected. The President, Dr. Frank L. Sim, of Memphis, Tenn., was, owing to illness, unavoidably absent, hence there was no annual address.

The subject chosen for discussion at the next meeting, at Detroit, Mich., on the first Monday evening in June, 1892, was "The Best Interest of the Medical Journal from a Literary Standpoint."

The election of officers for the ensuing year resulted in the choice of

Dr. Frank Woodbury, of Philadelphia, for President; Dr. C. H. Hughes, of St. Louis, Mo., Vice-President, and Dr. C. C. Culbertson, of Cincinnati, O., Secretary.

The Association then adjourned to enjoy its annual banquet at Chamberlin's, where the spirit of the medical press was manifested with singular unanimity on the best means of inspiring editorial work, occasional indulgence in recreation, and social intercourse.

THE PROGRESS OF INFECTIOUS DISEASES AND DEATH RATES AT THE MOST RECENT DATES.

ALABAMA.—*Mobile*, 40,000 : Reports 44 deaths during April, of which 9 were under five years of age. Annual death-rate, 12.16 per 1000. From zymotic diseases, 3, and from consumption, 9.

CALIFORNIA.—The new State Board by recent appointments, as noticed in April number, has organized by electing W. G. Cochran, of Los Angeles, President, and J. R. Laine, of Sacramento, Secretary. "For the first time in the history of the Board the members," says the *Occidental Medical Times*, "with one exception, belong to the dominant political party. The selection of the executive officer has also been made on political grounds. The matter is therefore not open to criticism in a medical journal, except to regret that such things should occur, and to state that it is not calculated to further the interests of medical or sanitary science."

It is gratifying to know, however, that State medicine is

common ground, upon which all parties may and should unite for the promotion of the public weal. Those who know the most about State medicine, and most efficiently practise it, should be the chosen ones for its administration, regardless of political considerations. In so far as the appointing powers neglect such qualifications, they forfeit public respect and deserve the reprobation of sanitarians. It is incumbent upon the new officials to justify their appointment by their acts. The way has been well opened for them by their predecessors, upon which they should improve, or expect condemnation.

Reports from sixty-seven cities, towns, and localities, having a population of 674,830, during April, show 1064 deaths to have occurred from all causes. Annual death-rate, 18.84. Deaths from consumption, 164; pneumonia, 153; bronchitis, 40, and congestion of the lungs, 8. Croup and diphtheria caused 69 deaths; typhoid-fever, 14.

San Francisco, 330,000: Deaths during the month of April, 562—139 under five years. From consumption, 83; acute lung diseases, 116; croup and diphtheria, 39; typhoid-fever, 5. Death-rate, 17.33.

Los Angeles, 65,000: Deaths, 67. From consumption, 19; acute lung diseases, 9. Death-rate, 12.37.

Oakland, 50,000: Deaths, 72. From consumption, 6; acute lung diseases, 15.

CONNECTICUT.—According to the Secretary's abstract of reports from 167 towns for April, 1891, there were 1260 deaths reported in the State during the month. This was 132 more than in March; it was 173 more than in April, 1890, and 192 more than the average number of deaths in April for the five years preceding the present.

The death-rate for the large towns was 19.8; for the small towns, 21.0, and 20.3 for the whole State.

The deaths from zymotic diseases were 157, being 12.4 per cent. of the total mortality against 13.3 per cent in March.

New Haven, 86,045: Deaths, 153—under five, 29; from zymotic diseases, 12. Death-rate, 18.2.

Hartford, 53,230: Deaths, 113—under five, 28; from zymotic diseases, 13. Death-rate, 20.5.

Bridgeport, 48,866: Deaths, 80—under five, 19; from zymotic diseases, 7. Death-rate, 18.4.

The highest death-rates were, respectively, in Stamford, 38.2; Stonington, 35; Naugatuck, 27; New London, 26.1; Killingly, 25.6. The lowest, Putnam, 5; Winchester, 6; Wallingford and Groton, each, 7; Manchester, 8.

DISTRICT OF COLUMBIA—250,000: Total deaths in four weeks ending April 25th, 674—167 under five years of age. From zymotic diseases, 60; consumption, 116. Death-rates, white, 30.4; colored, 50.1: 35.3.

FLORIDA.—*Pensacola*, 15,000: Four weeks ending April 25th. Deaths, 14. Death-rate, 15.

ILLINOIS.—*Chicago*, 1,200,000. Deaths during the month of April, 3450—1684 under five years of age. Death-rate, 34.50. From zymotic diseases, 567; consumption, 231.

IOWA.—*Davenport*, 28,500. Deaths during the year 1890, 386—an increase of 19 over the preceding year; 62 were caused by zymotic diseases, of which 55 were caused by diphtheria—28 less than in the preceding year. Consumption, 22. Death-rate, 16.25 Deaths during April, 1891, 26. Annual death-rate, 11.1 per 1000.

Des Moines, 53,000: Deaths during April, 36. Death-rate, 8.1.

Dubuque, 30,147: Deaths during April, 27. Death-rate, 29.

LOUISIANA.—*New Orleans*, white, 184,500; colored, 69,500: 254,000. Deaths during the four weeks ending April 25th, 516—under five years of age, 151. Death-rate, white, 25.32; colored, 36.4. From zymotic diseases, 169, and from consumption, 71.

MARYLAND.—*Baltimore*, 455,427: Deaths during April, 850, as against 724 for the corresponding month of 1890. Of these, 648 were white and 202 colored, a death-rate of 20.85 per 1000 for the former and 34.42 per 1000 for the lat-

ter. The death-rate for the whole population was 22.41 per 1000. 42 persons died from infectious diseases, 106 from consumption, and 135 from pneumonia. 243, or 28.6 per cent of the total deaths, were in children under five years of age.

Cumberland.—The increasing unhealthfulness of this city for the last year or two has recently led to a house-to-house inspection, and special report to the mayor by the Secretary of the State Board of Health. The conditions revealed a board of health made up of the city council, without a health officer; promiscuous methods of dealing with the filthiest of all filth—without any system of house drainage—by temporarily storing or hiding it into all sorts of receptacles, whence it is subject to gradual seepage into the watercourses and wells round about; the accumulations of garbage in the back yards; the toleration of pig-pens throughout the city; the throwing of the carcasses of animals and the refuse of slaughter houses into the river and canal; an apparent fondness of foul water, and the numerous lesser evils which such great ones beget, sufficiently account for the criminal sickness. This report in detail is worthy of the widest possible dissemination for the benefit of other localities.

MASSACHUSETTS.—Examinations by the State Board of Health of the Water-Supplies and Inland Waters of Massachusetts, 1887-90. Part I. of Report on Water-Supply and Sewerage. A volume of 857 closely printed pages, appropriately illustrated with maps and diagrams, replete with information of the first importance to the health of the people. It comprises chemical and biological examinations of 135 water-supplies and of the 18 river-basins in the State, including the principal streams and their tributaries, embracing not only an examination of the water-supplies already in use, but also of the rivers and of many available sources of supply not now in use; giving interpretation of the chemical analyses, the organisms, excepting bacteria, found in the waters; a summary of the water-supply statistics, with records of rainfall, flow of streams, and temperature of the air and water; a classification of the drinking waters; special topics relating to the quality of public water-supplies, such as the effect of different kinds of storage, the effect of storage on waters from different

sources, etc., and the pollution and self-purification of streams ; the chemical evidence of the pollution of waters ; normal chlorine ; the idea of permanence, and of various degrees of susceptibility of organic matter to decay in water ; the absence of dissolved oxygen and the hindrance to self-purification of organic matter in some waters at considerable depths at different seasons of the year ; the effect of growing plants in the purification of waters ; the chemical evidence of bacterial action in the character of the changes of organic matter ; the normal difference in surface waters and ground waters ; the influence of the season of the year on the quality of surface waters. All told, the volume constitutes the most important contribution to our knowledge of the distinction between normal and polluted waters, and their respective relations to sources of supply and other conditions, hitherto published ; and comprises a fund of information of incalculable value to all sanitary authorities and practitioners.

Boston, 448,477 : During April, 1891, deaths reported, 913, of which number 252 were under five years of age. Annual death-rate per 1000, 24.42. From zymotic diseases, 76, and from consumption, 125. Cases of contagious diseases reported, 647.

MICHIGAN.—Seventeenth Annual Report of the Secretary of the State Board of Health for the fiscal year ending June 30th, 1889. A volume of 324 pages, with numerous diagrams and charts showing the relation of prevailing diseases to meteorological conditions, much statistical matter related to the causation of disease, and the progress of practical sanitation in the State generally, much of which has already appeared, in abstract, in these pages, from the Secretary's monthly reports ; it being, indeed, one of the praiseworthy characteristics of the progressive Secretary of the State Board of Health of Michigan to give to his fellow-sanitarians and the public generally the benefit of his investigations as they proceed. The report is, therefore, chiefly a summary of matter before published in instalments, tabulated and graphically illustrated, showing the results of numerous observations on the relation of meteorological conditions to the prevalence of different diseases throughout the State, and the influence of unsanitary

local conditions in certain special diseases—diphtheria and typhoid-fever—and the efforts made for their repression. It contains besides a number of special reports on communicable diseases, public institutions, diet lists, etc., of interest to sanitarians generally, and of special interest to citizens of all classes in the State of Michigan, among whom it is worthy of the widest possible distribution.

For the month of April, 1891, compared with the preceding month, the reports indicate that dysentery and inflammation of bowels increased, and that cholera-infantum, cerebro-spinal-meningitis, inflammation of brain, and membranous croup decreased in prevalence.

Compared with the preceding month, the velocity of the wind was less, the prevailing direction was west and southwest (instead of north), the temperature was much higher, the absolute humidity was considerably more, the relative humidity was slightly less, the day ozone was more, and the night ozone was considerably more.

Compared with the month of April in the five years 1886-90, influenza was very much more prevalent, and cholera-infantum, measles, whooping-cough, puerperal-fever, typho-malarial-fever, cerebro-spinal-meningitis, intermittent-fever, erysipelas, inflammation of kidney, inflammation of bowels, and diphtheria were less prevalent in April, 1891.

For the month of April, 1891, compared with the average of corresponding months in the five years 1886-90, the velocity of the wind was slightly less, the prevailing direction about the same, the temperature was higher, the absolute humidity and the relative humidity were slightly more, the day ozone was about the same, and the night ozone was much more.

Including reports by regular observers and others, diphtheria was reported present in Michigan in the month of April, 1891, at fifty-one places; scarlet-fever at seventy-nine places; typhoid-fever at fourteen places, and measles at one hundred and four places.

Reports from all sources show diphtheria reported at one place less; scarlet-fever at one place more; typhoid-fever at three places less, and measles at six places more in the month of April, 1891, than in the preceding month.

Detroit, 220,000: During April, deaths, 374—under five

years of age, 74. Death-rate, 20.68. From zymotic diseases, 58; from consumption, 29, and from pneumonia, 57.

MINNESOTA.—*Public Health* bulletin for March reports: Population of the State (census of 1890) for the purpose of this report is as follows:

State, 1,301,826. Cities of more than 100,000 (St. Paul and Minneapolis), 297,894. Cities of 15,000 to 50,000 (Duluth and Winona), 51,323. Cities of 5000 to 15,000 (Stillwater, Mankato, St. Cloud, Faribault, Red Wing, Rochester), 44,752. Cities of 2000 to 5000 (census returns not yet at hand). Villages and townships under 2000 (census returns not yet at hand).

Total deaths, 905 (males, 494; females, 411). Last month this mortality was 1055; in February, 1890, it was 859, while the average of February for the last four years was 1014.

In St. Paul and Minneapolis, with 22.88 per cent of the population of the State, the mortality was 341, or 37.63 per cent of the total mortality.

Measles: Mortality 17, and increasing. December, 1890, 7; January, 1891, 11. Distribution, eleven localities in nine counties.

Diphtheria, 45—not half as great as last month (97), and smaller than for any February since 1886. Distribution, twenty-two localities in nineteen counties.

Croup, 20 deaths, distributed in nineteen localities and fifteen counties. The average mortality from this cause in February for the last five years was 15.8.

Enteric (typhoid) fever, 28 deaths, and nearly the average for the last five years. Distribution was ten localities in ten counties.

Tuberculosis (phthisis, 79; other forms, 13), 92; 9.06 per cent of all deaths (males, 53; females, 39). Average mortality in this month, for the last four years, 105.

Bronchitis, 33 deaths, in eleven localities.

Pneumonia, 92 deaths, less than the average (107) for the last four years.

St. Paul, 150,000: Deaths during April, 158—66 under five years of age. Deaths from zymotic diseases, 24; from consumption, 10. Death-rate, 12.64.

MISSOURI.—*St. Louis*, 460,000 : Deaths during April, 842—under five years, 315. Death-rate, 21.96. From zymotic diseases, 99, and from consumption, 83.

The Mayor's recent appointments of medical officers are, as reported and commented upon by the *Weekly Medical News* of May 9th, as follows :

"Dr. W. N. BRENNAN, Health Commissioner, we have known for some years ; his gentlemanly address will commend him to the public, and his long medical experience will abundantly qualify him for the discharge of his official duties.

"Dr. HEINE MARKS is a young active member of the St. Louis medical profession, and is a gentleman of studious habits ; his industry, fidelity, and practical good judgment will enable him to discharge ably the manifold duties of Superintendent of the City Hospital.

"Dr. ERNEST MUELLER, Superintendent-elect of Insane Asylum, will carry with him thither experience of former years, as well as a high degree of medical attainment.

"Dr. R. M. KERLEY, Superintendent of Female Hospital, is a gentleman of long medical practice and experience in this and other cities, and in the discharge of his duties will give satisfaction to patient and the public.

"Dr. H. C. HARKINS, chief dispensary physician, is one of the brightest young fellows in the city, thoroughly industrious and painstaking, besides, a young man of most excellent moral training."

NEW JERSEY.—*Hudson County*, 283,850 : Deaths during April, 862—under five years, 341. From zymotic diseases, 109 ; from consumption, 77. Death-rate, 36.4.

Paterson, 78,358 : Deaths during April, 228—80 under five years of age. Death-rate, 28.25. Deaths from zymotic diseases, 24 ; from consumption, 19.

NEW YORK.—The Secretary of the State Board reports the mortality for April 13,981, or 463 deaths daily, the largest that has ever been recorded for one month in this State ; it exceeds that of January, 1890 (the highest previously recorded) by 65 deaths daily ; that of April, 1890, by 166, and that of March, 1891, which was greater by 34 deaths daily than the

preceding months of the year, by 118 deaths daily. The deaths from ordinary zymotic diseases have not varied much in either of these months. The increase is due to the epidemic of influenza or *la grippe* which, beginning in mild form in February, caused an estimated mortality of 1000 in March, and in April has apparently been the cause of 4500 to 5000 deaths, excess above April, 1890, all allowances being made. This is greater by nearly 1000 than the estimated mortality from this cause in January, 1890. The onset of the epidemic has been much less rapid than in 1890, when it reached its height in less than one month from its commencement. Outside of the large cities only about 500 deaths have been attributed to this cause. The increase has shown itself in deaths from acute respiratory diseases, which caused one fourth of the mortality, consumption (to a much less degree than in 1890), diseases of the nervous system (causing one tenth of all deaths), and other local diseases in a smaller ratio. The mortality among the aged has been very great, and from diathetic diseases not classified. Returns being received from 5,600,000 population, the annual death-rate for the month is 30.00 per 1000; from zymotic diseases, 2.70 per 1000; of deaths under five years of age, 8.21, which is much greater than in January, 1890. Diphtheria has materially diminished; scarlet-fever has increased; measles and whooping-cough are the same as last month. The typhoid-fever epidemic of Albany, Cohoes, and Schenectady has largely abated.

New York, 1,680,796: Total deaths, 5048—1790 under five years. Death-rate, 36.55. Zymotic diseases per 1000 deaths from all causes, 123.00. Deaths from consumption, 508.

Brooklyn, 862,155: Total deaths, 2491—838 under five years. Death-rate, 35.18. Zymotic diseases per 1000 deaths from all causes, 32.05. Deaths from consumption, 199.

Albany, 100,000: Total deaths, 268—45 under five years. Death-rate, 32.16. Zymotic diseases per 1000 deaths from all causes, 51.85.

Syracuse, 88,000: Total deaths, 129—23 under five years. Death-rate, 17.60. Deaths from zymotic diseases per 1000 deaths from all causes, 61.50. Deaths from consumption, 19.

Buffalo, 255,000: Total deaths, 735—230 under five years of age. Death-rate, 34.54. Deaths from zymotic diseases

per 1000 deaths from all causes, 61.22. Deaths from consumption, 63.

Rochester, 138,327 : Total deaths, 206—53 under five years of age. Death-rate, 17.82. Deaths from zymotic diseases per 1000 deaths from all causes, 99.05. Deaths from consumption, 40.

NORTH CAROLINA.—(April) *Bulletin* : Summary of mortality statistics for March, 1891, fifteen towns, aggregate population, 56,814 white, 46,312 colored—103,126. Deaths, white, 61 ; colored, 90 : 151. Deaths under five years of age, 52. Death-rates, white, 12.9 ; colored, 23.3 : 15.6. Of the total number of deaths reported, 27 were caused by consumption ; 16 by pneumonia ; by other diseases, 1 to 4.

OHIO.—*Monthly Sanitary Record* for April gives abstract of reports of deaths and causes, seventy-seven cities and towns, during the month of *March*, in part as follows :

Cincinnati, 296,908 : Deaths, 561—under five years, 141 ; from zymotic diseases, 59 ; croup and diphtheria, 17 ; typhoid-fever, 15. From consumption, 71 ; pneumonia, 81. Death-rate, 22.67.

Cleveland, 261,353 : Deaths, 360—under five years, 112 ; from zymotic diseases, 67 ; croup and diphtheria, 17 ; typhoid-fever, 11 ; whooping-cough, 7. From consumption, 33 ; pneumonia, 50. Death-rate, 16.52.

Columbus, 88,000 : Deaths, 128—28 under five years ; from zymotic diseases, 16—croup and diphtheria, 8. From consumption, 29 ; pneumonia, 11. Death-rate, 17.42.

Dayton, 61,220 : Deaths, 79—under five years, 21 ; from zymotic diseases, 11—croup and diphtheria, 7. From consumption, 15 ; pneumonia, 9. Death-rate, 15.48.

Toledo, 81,434 : Deaths, 135—under five years, 24 ; from zymotic diseases, 19—croup and diphtheria, 7. From consumption, 18 ; pneumonia, 13. Death-rate, 19.89.

(Toledo Board of Health reports for the year 1890 : Population, 82,652—1218 more than the State Board estimate. Deaths, 1374—580 under five years of age. From zymotic diseases, 430, or 31.29 per cent, as against 26.5 per cent in 1889, and 21.73 per cent in 1888. This increase of 110

deaths is made up as follows: Diphtheria, 60; typhoid-fever, 11; cholera-infantum, 18; croup, 14; influenza, 13; measles, 10; while there was a diminution of deaths in diarrhoeal diseases of 61 and in whooping-cough of 7. From consumption, 135—9.8 per cent of the total mortality. Death-rate, 16.62.)

The highest death-rates were in Ada (2079), 69.26; Felicity (800), 60.00; Forest (1126), 42.61; Ashley (628), 38.21; Wellston (4694), 33.26; Hudson (1119), 32.17. The lowest were in Marion (8327), 2.88; Oberlin (4376), 5.48; East Liverpool (10,956), 8.76; Sidney (4850), 9.89.

Average death-rate for the whole seventy-seven localities, 17.29.

PENNSYLVANIA.—*Philadelphia*, 1,069,264: Reports for four weeks ending April 25th, 1897 deaths—585 under five years of age. Death-rate, 29.32. Deaths from typhoid-fever, 115; croup and diphtheria, 78. From consumption, 194—10.56 per cent of total mortality.

Pittsburg, 247,000: Deaths during the four weeks ending April 28th, 797—296 under five years. Death-rate, 41.94. The prevailing causes of death were: Pneumonia, 206; influenza, 69; bronchitis, 65; cerebro-spinal-fever, 59.

RHODE ISLAND.—Reports from medical correspondents in all parts of the State show that for April, 1891, the influenza, or *la grippe*, continued to be the most prominent cause of sickness, taking the whole population, with considerably lessened severity and decrease in numbers in the towns bordering on Narragansett Bay and the ocean, and slightly lessened severity in other parts of the State.

The reports indicate that, otherwise than of influenza, the amount of general sickness was rather less than in the preceding month, pneumonia and bronchitis still holding considerable prominence, partly as sequelæ of influenza; and diphtheria, measles, scarlet-fever, whooping-cough as having a lessened general prevalence.

The number of deaths recorded in the different towns and cities, from which returns have been received, was 388. The towns making returns represent a population (on the basis of

the census of 1890) of 280,503. Annual death-rate upon the estimate given is 16.6 in every 1000 of the population.

WISCONSIN.—*Milwaukee*, 230,000 : Deaths reported during April, 550—248 under five years of age. Death-rate, 28.70. Prevailing causes of death : Pneumonia, 64 ; convulsions, 52 ; bronchitis, 48 ; diphtheria and croup, 44 ; consumption, 37 ; influenza, 28.

CANADA.—*St. Lawrence Quarantine Service*. Frederick Montizambert, M.D., F.R.C.S., D.C.L., Medical Superintendent, reports for the year 1890 : Vaccinations, 858—a continued diminution from the numbers 1059 in 1889 and 4000 in 1888 ; in itself not to be taken as an index of neglect by ships' surgeons, as in it are included the crews of the four small-pox vessels, numbering 225 in all, vaccinated by the Superintendent at quarantine, but attributable to the better observance of the regulations by the ships' surgeons. Four vessels arrived during the year reported small-pox, with one recent case each. All were disinfected with mercuric chloride drench and superheated steam. Appended is the paper on Vaccinal Protection of Passengers from Europe, read at the meeting of the American Public Health Association, at Charleston, in December last.

A SAFE HOUSEHOLD DISINFECTANT.—Professor Pemberton Dudley, of Philadelphia, well says that “an important consideration to be kept in view in prescribing a disinfectant for general household use is to select one which is free from danger, even in inexperienced hands. Among those that can be depended on for such use are pre-eminently the chloride of lime solutions and the well-known Platt's Chlorides. The latter has the advantage of being always ready for use, with full directions for its various applications. It can also be said of it, that its efficiency is thoroughly established.”

LITERARY NOTICES AND NOTES.

MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS, with Especial Reference to the Clinical Application of Drugs. By JOHN V. SHOEMAKER, A.M., M.D., Professor of Materia Medica, Pharmacology, Therapeutics, and Clinical Medicine, and Clinical Professor of Diseases of the Skin in the Medico-Chirurgical College of Philadelphia ; Physician to the Medico-Chirurgical Hospital, etc.; and JOHN AULDE, M.D., Demonstrator of Clinical Medicine and of Physical Diagnosis in the Medico-Chirurgical College of Philadelphia, and Member of the American Medical Association. In two volumes, 8vo, pp. 366 and 659. The volumes are sold separately : Volume I., cloth, \$2.50; sheep, \$3.25. Volume II., cloth, \$3.50; sheep, \$4.50. F. A. Davis, Medical Publisher and Bookseller, 1231 Filbert Street, Philadelphia, Pa., and London, Eng., 40 Berners Street, Oxford Street, W.

The first volume of this work is devoted to Pharmacy, General Pharmacology, and Therapeutics, and remedial agents not properly classed with drugs. The second volume is wholly taken up with the consideration of drugs, each remedy being studied from three points of view—viz., the Preparations, or Materia Medica ; the Physiology and Toxicology, or Pharmacology ; and, lastly, its Therapy.

This is a work of unusual completeness, showing from beginning to end thorough mastery of the comprehensive subject of which it treats, great painstaking to so present it as to afford the utmost facility to the student for practical study and to the medical practitioner for ready reference. It is fully abreast with the period, in that the *materia medica* and practical pharmacy, and the therapeutics which it presents are disengaged from the load of much that is worthless and redundant that has been retained hitherto in other treatises on the same subjects, while it, more fully than any other, comprises all the new remedies and advances in therapeutical knowledge of recent years.

PRACTICAL POINTS IN THE MANAGEMENT OF SOME OF THE DISEASES OF CHILDREN. By I. N. LOVE, M.D., Professor of Diseases of Children, Clinical Medicine and Hygiene, Marion-Sims College of Medicine, St. Louis, Mo.; President Pediatric Section of American Medical Association, 1890; Editor *Medical Mirror*, St. Louis, Mo., etc., and

PRACTICAL NOTES ON URINARY ANALYSIS. By W. B. CANFIELD, A.M., M.D., Chief of Chest Clinic and Lecturer on Clinical Medicine, University of Maryland; Visiting Physician to the Union Protestant Infirmary, Bay View Hospital, Baltimore, etc.

These are both excellent epitomes of the subjects of which they respectively treat, and well illustrate the value of "THE PHYSICIAN'S LEISURE LIBRARY" series of practical works, issued monthly, 25 cents a volume, \$2.50 a year. George S. Davis, Detroit, Mich.

WOOD'S MEDICAL AND SURGICAL MONOGRAPHS, MAY NUMBER: Differentiation in Rheumatic Diseases (so called), by Hugh Lane, L.R.C.P.; Mental Affections of Childhood and Youth and Other Papers, by J. Langdon Down, M.D.; Cure of the Morphia Habit, by Oscar Jennings, M.D.; Notes on the Examination of the Sputum, Vomit, Fæces, and Urine, by Sidney Coupland, M.D. \$1; \$10 a year. William Wood & Co., New York.

ORIGIN, PURPOSE, AND DESTINY OF MAN; OR, PHILOSOPHY OF THE THREE ETHERS. By WILLIAM THORNTON. Boston: Published by the Author, 1891.

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ALDEN'S MANIFOLD CYCLOPÆDIA, Volume 25, Montegro—Neutrals, maintains the same degree of excellence as the preceding volumes. Among the longer articles of this volume, and especially worthy of notice on account of the care with which they are brought down to date, may be mentioned, Mormons, fourteen pages; Mortality, six pages, comprising tables showing the mean duration of human life according to various authorities, and American tables based on American experience of various life insurance companies; Napoleon, Negro, Nervous System. For free specimen pages address the publishers, the Columbian Publishing Co., 393 Pearl Street, New York.

GETTING MARRIED AND KEEPING MARRIED. By ONE WHO HAS DONE BOTH. No 18, of the Human Nature Library. Price, 10 cents. Fowler & Wells Co., New York.

A pamphlet of twenty-two pages, devoted to the consideration of marriage from a phrenological standpoint, which comprises excellent advice: study well the character of one you think of marrying, always bearing in mind the advice of *Punch*, in case of doubt, *don't*.

CHRISTIAN WORK, by LEADING CHURCHMEN. *The National Tribune*, Washington, D. C., announces that it will shortly begin the publication of a highly interesting series of articles on the condition, development, and prospects of the great churches in this country, by the leading men of the several churches. The articles and their contributors are: Roman Catholic Church, Cardinal Gibbons, Archbishop of Baltimore; Methodist Episcopal Church, Bishop John P. Newman; Protestant Episcopal Church, Rt. Rev. Leighton

Coleman, S.T.D., LL.D., Bishop of Delaware ; Presbyterian Church, Rev. Dr. H. M. McCracken, Chancellor of the University of the City of New York ; Unitarian Church, Rev. Edward Everett Hale, the distinguished author ; Evangelical Lutheran Church, Professor E. J. Wolff, of the Gettysburg Seminary ; Congregational Church, Rev. J. N. Whiton, of the Trinity Church, New York City ; Baptist Church, Robert S. McArthur, D.D., pastor Calvary Baptist Church, New York City.

Subscription price of paper, \$1 a year ; three months containing these articles, 25 cents. Address *The National Tribune*, Washington, D. C.

THE MEDICAL AND SURGICAL REPORTER OF MAY 2D, edited and managed by EDWARD T. REIGHTER, M.D., in the place of CHARLES W. DULLES, M.D., who took his farewell two weeks before, comes out with about the only improvement it is capable of, under the circumstances, an increased quantity of matter—twelve pages additional. The excellence of the *Reporter* under Dr. Dulles's management has been such as to make us regret his retirement, and our highest hope for his successor is that he may emulate his predecessor.

ANALES DE LA ASISTENCIA PUBLICA, fourth number of the first volume, Buenos Ayres, February 15th, 1891, contains matter of great interest to the sanitarian. The first article, Vaccination in Buenos Ayres, discusses the subject on general results and on its local benefits to society. The second, Considerations on Intermittent or Marsh Fevers, gives a great deal of valuable information, and an article on Public Hygiene is of local and general interest. Other articles—The Study of the Epidemic of Grippe or Influenza in the Argentine Republic in 1890, Conclusion ; Meteorology and Hygiene, and the Sanitary Condition of the City—will be found to possess much interest.

ANALES DEL DEPARTAMENTO NACIONAL DE HIGIENE, Volume I., No. 1, a monthly publication of 64 pages directed by Drs. PEDRO N. ARATA and EMILIO R. CONI. The readers of the SANITARIAN will recognize the reappearance, under a

different title and improved form, of one of our most valued exchanges. The veteran editor, Emilio R. Coni, contributes a valuable article on Policia Veterinaria—the inspection of meat intended for food. Articles on Epidemiology, the National Conservatory of Vaccination, School Hygiene, Meteorology, Analysis of the Air, to determine ozone, carbonic acid, free ammonia, and organic ammonia; Bacteriological Analysis of the Air, Marriages, Births, and Deaths, etc., make an exceedingly interesting number.

REVISTA CLINICA DE LOS HOSPITALES, Madrid, April, 1891. An article on the loss of memory of words and also of written characters is of interest. Clinical Considerations on Infection in Endocarditis, Developed by Parasitic Processes, Koch's Lymph in Dermatology, Pediatrics, etc., make an interesting number.

REVUE INTERNATIONALE D'ELECTROTHÉRAPIE, publiée le 1^{er} de chazul mois, 2^{me} Année, February and March, 1891, has among its contributors some of the ablest men in France, and in every part of the world where attention is given to the study and application of electrothérapie. An exceedingly interesting article is contributed by Dr. G. Apostoli, Documens pour servir à l'Histoire de l'Electrothérapie des fibrômes utérins.

LA LINFA DE KOCH, por el doctor JUAN AZÚD, is a pamphlet containing the article in the *Revista Clinica*. The details given by the writer, who is familiar with his subject, will repay a careful examination.

"THE AMERICAN GIRL of a decade ago has effaced herself," says Charles Dudley Warner in the "Editor's Drawer" of *Harper's Magazine* for June. "She is no longer the daring, courageous creature. In England, in France, in Germany, in Italy, she takes, as one may say, the color of the land. The satirist will find no more abroad the American girl of the old type whom he continues to describe. The knowing and fascinating creature has changed her tactics altogether, and the change has reacted on American society. The mother has

come once more to the front, and even if she is obliged to own to forty-five years to the census-taker, she has again the position and the privileges of the blooming woman of thirty. Her daughters walk meekly and with downcast (if still expectant) eyes, and wait for a sign. . . . It is enough now to notice that a change is going on, due to the effect of foreign society upon American women, and to express the patriotic belief that whatever forms of etiquette she may bow to, the American girl will still be on earth the last and best gift of God to man."

LONDON HOTELS FOR AMERICANS.—The *Home Journal* devotes an entire page of its issue of May 6th to what may be called a guide to London hotels, though the formality of a "Guide" is avoided, and the information is put in a current, readable style, which renders it entertaining even to the stay-at-home tourist. But to the actual tourist, purposing to make a longer or shorter stay in London—and what transatlantic *voyageur* nowadays does not?—this guide will prove an indispensable *vade mecum*. It has been prepared with especial reference to the requirements and tastes of Americans. It is very explicit in its descriptions of the character and accommodations of hotels, the special advantages of their individual location, their charges for board, and many things beside that cannot be classed under any head, but which are of practical interest to all who intend to go to London, even those who have already visited the great Metropolis more than once. The article was prepared by Mr. Morris Phillips, who has spent many seasons in London and has made the London hotels a field of special investigation; the information he gives is fresh and trustworthy. Contributing to the usefulness of this Guide, some notes are added on London boarding-houses, and also on London restaurants—where to lunch and where not to lunch.

THE BEST RECIPE FOR REST.—There is nothing which will give a chance for rest to overtired nerves so surely as a simple religious faith in the overruling, wise, and tender Providence which has us in its keeping. It is in chafing against the conditions of our lives that we tire ourselves immeasurably. It is

in being anxious about things which we cannot help that we often do the most of our spending. A simple faith in God which practically and every moment, and not only theoretically and on Sundays, rests on the knowledge that He cares for us at least as much as we care for those who are the dearest to us, will do much to give the tired nerve the feeling of the bird in its nest. Do not spend what strength you have, like the clematis, in climbing on yourself, but lay hold on things that are eternal, and the peace of them will pass into your soul like a healing balm. Put yourself in the great everlasting currents, and then you can rest on your oars, and let those currents bear you on their strength.—From “*The Technique of Rest,*” by Anna C. Brackett, in *Harper’s Magazine* for June.

THE DERVISH.—A dervish, lazy and hungry, met a Sufi poet, and he begged of him alms ; but the son of songs and the father of sayings said, “ I have only the wisdom of God, the advice of the dead, and the songs of men.”

“ Will a song fill my paunch ? ” cried the other. To whom made answer the poet : “ Sing a song of sixpence, and that will fill your pocket with rye ; and scatter the rye, and that will fetch silly blackbirds to make for you a pie—and any girl will cook it.”

“ Thanks,” said the man.—From “*Haroun the Caliph, and Others,*” in the June *Century*.

MY WIFE’S MINIATURE.

SWEET emblem of the dear love,
Ever precious to my soul ;
In whatever clime I rove,
Or amid great oceans roll,
I will hold you ever near,
When away from her you type ;
For you give the semblance here,
Tho’ you’re *not* your prototype.
Tho’ on me you never smile,
I know where the smile would be ;
Think of it with reconcile,
Because now she sighs for me.

—From an *Old Cruiser’s Locker.*

ANNOUNCEMENTS.

THE SEVENTH INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY will be held in London, August 10th-17th, 1891. The meetings of the Section of Preventive Medicine will be held under the presidency of Sir JOSEPH FAYRER in Burlington House, Piccadilly, on Tuesday, Wednesday, Thursday, and Friday, August 11th, 12th, 13th, and 14th, between 10 A.M. and 4 P.M. On Tuesday, August 11th, after a short address by the President, a discussion will be held upon "The Mode of Preventing the Spread of Epidemic Disease from one Country to Another." The discussion will be opened by Surgeon-General J. M. Cunningham, C.S.I., of London. On Wednesday, August 12th, a discussion will be held upon "Diphtheria, with Special Reference to its Distribution and to the Need for Comprehensive and Systematic Inquiry into the Causes of its Prevalence in Certain Countries or Parts of Countries, with a View to its Prevention." The discussion will be opened by Dr. Edward Seaton, of London, and continued by leading representatives of France and America. On Thursday, August 13th, a discussion will be held upon "The Relation of Alcoholism to Public Health, and the Methods to be Adopted for its Prevention." The discussion will be opened by Sir Dyce Duckworth, LL.D., M.D., of London, and by Professor Westergaard, of Copenhagen. On Friday, August 14th, papers on miscellaneous subjects will be read and discussed. A list of papers accepted by the Section will be published later. Communications respecting the Section should be addressed to

DR. ISAMBARD OWEN,
40 Curzon Street, London, W.

AN INTERNATIONAL MEDICAL CONGRESS.—The managers of the National Prohibition Park, of Staten Island, invite representative medical men from all localities in the United States and the Dominion of Canada to meet in conference on July 15th and 16th next, in the great Auditorium Building of the park. The chief object of the meeting is to be the comparison of views on the relationship of physiology and alcohol.

The Congress will assemble at 10 A.M., July 15th and 16th, and continue its session for two days. It is expected that arrangements will be made for reduced railroad fares.

CHARLES F. DEEMS,
President of the Park Association.

R. S. CHEVES, *Secretary,*
West New Brighton, N. Y.

All communications should be addressed to the Secretary.

CONGRESS OF AMERICAN PHYSICIANS AND SURGEONS will be held in Washington, from 3 to 6 P.M., September 22d, 23d, 24th, and 25th, 1891.

WILLIAM PEPPER,
Chairman of the Executive Committee.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION will hold its next annual meeting in conjunction with The Congress of American Physicians and Surgeons to be held in Washington, D. C., September 22d to 25th, 1891.

It is desirable that our Association shall have a good showing of members present at this special *triennial meeting*, as we had at the previous meeting of the Congress, and further and especially that our programme shall be worthy of the occasion. To make it so will require the co-operation of many of the members. Those proposing to aid us by presentation of papers will greatly oblige the officers if they will notify the President or Secretary as soon as possible, in order that the programme may be suitably arranged, and that the officers may know upon what material they can rely.

It is to be hoped that a goodly majority of the members may resolve to aid the Association at least with their presence, and that many will promptly respond to this announcement with the subject title of a proposed paper.

F. I. KNIGHT, M.D., *President,*
377 Boylston Street, Boston, Mass.
J. B. WALKER, *Secretary,*
1617 Green Street, Philadelphia.

ASSOCIATION OF AMERICAN ANATOMISTS.—The next meeting of the Association will be held at Washington, D. C., at

or about the time of meeting of the Congress of American Physicians and Surgeons in September, 1891. The officers for the meeting are as follows: President, Joseph Leidy; Vice-Presidents, Frank Baker and F. D. Weisse; Secretary and Treasurer, D. S. Lamb; Executive Committee, Harrison Allen, Thomas Dwight, and B. G. Wilder.

APPOINTMENTS IN THE NEW YORK STATE LUNATIC ASYLUMS.—An open competitive examination of candidates for junior assistants and female physicians in the State hospitals for the insane will be held by the State Civil Service Commission at the Capitol, in Albany, on June 11th. Candidates must be residents of the State and must have had a year's hospital experience or three years' experience in the general practice of medicine.

DR. J. C. CULBERTSON, for many years editor of the *Lancet* and *Clinic*, Cincinnati, has been appointed editor and manager of the *Journal of the American Medical Association*.

THE LONG ISLAND COLLEGE HOSPITAL announces for 1891:

1. The regular course of lectures will hereafter be six months in duration.
2. Three courses of lectures will hereafter be required for graduation.
3. Joshua M. Van Cott, Jr., M.D., has been appointed Professor of Histology and Pathological Anatomy vice Frank Ferguson, M.D., who has resigned.
4. The medical class of the present year numbered 250; the graduating class, 82.
5. 20,830 patients were under treatment in the hospital and dispensary during the year 1890.

J. H. RAYMOND, M.D.,
Secretary of Faculty, Brooklyn, N. Y.

PRIZES.—The *Bulletin de Medicina Naval* announces that the Section of Madrid, Sociedad Española de Higiene, desirous of encouraging the study of hygiene, has decided to offer a series of prizes for competition to writers who con-

tribute essays on hygiene, in which, omitting original investigations and the study of questions purely scientific and technical, they desire to give to the public, in a form reduced to practical rules and succinct conclusions, everything that science has established for the prevention of disease and for improving the hygienic condition of life.

With this intention it proposes the following subjects for discussion :

1. Hygiene of the gymnasium and its influence in developing the organism in both sexes.

2. Any subject on hygiene to be selected by the writer.

For each subject there will be a premium and an accesit ; the premium will consist of a diploma conferring on the recipient the title of corresponding member, if the author be not already a member of the Society, and in addition the sum of 250 pesetas. The accesit will consist of the diploma only. The jury may make honorable mention of any number of the writers if merited by their contributions.

The essays are to be sent to the Secretary of the Society—Montera, 22, until July 1st, 1891.

The essays may be written in Spanish, French, or Italian, and to contain matter sufficient to make about sixteen pages in octavo.

The usual conditions as to name and address in such cases are to be observed.

Sanctioned by vote of the Junta Directiva, at the meeting held March 28, 1891.

MODESTO MARTINEZ PACHECO,
President.

JOSÉ PAREDA Y SANTIN,
Secretary-General.

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